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Bumblebee Program - Aerodynamic Data

Part III - Pressure Fields at Mach Numbers 1.5 and 2.0

G. A. Barnes and L. L. Cronvich

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NASA Contractor Report 3116

Bumblebee Program - Aerodynamic Data

Part III - Pressure Fields at Mach Numbers 1.5 and 2.0

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Laurel, Maryland

Prepared for
Langley Research Center
under Contract L-60036A

National Aeronautics
and Space Administration

Scientific and Technical
Information Office

1979

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	Tabulated Pressure Data at M = 1.5 and 2.0	

SUMMARY

This report provides data that supplements the M = 2.0 flow field data given in Part II. The enclosed data package (Appendix A) describes the Mach number effect by means of pressure fields only, at M = 1.5 and 2.0, and at angles of attack up to 23° at a mid-body station where a wing might be located. It was necessary to use the mid-body station for a Mach number comparison since there are no data available from the Bumblebee Program at a Mach number other than 2.0 corresponding to the flow survey station of Part II where a tail surface might be located.

INTRODUCTION

The flow field data given in Part II were compiled for the purpose of aiding the theoretician in his efforts to develop and verify computational methods for defining the complex flow field around missile bodies at relatively high angles of attack. The data of Part II are for M = 2.0 and define the flow field around a conical-nosed cylindrical body in a crossflow plane that is a likely location for the tail surface of a missile.

The purpose of this Part III report is to provide additional data that can be used to define the Mach number effect (M = 1.5 and 2.0) on flow field characteristics around a missile body at relatively high angles of attack (to α = 23°).

This report is the third in a four-part series published under the general title:

"Bumblebee Program - Aerodynamic Data"

Part I discusses the purpose of this effort and how the information in the other three reports is related.

Part II presents data at M = 2.0 which define the flow field around a conical-nosed, cylindrical missile body in a crossflow plane corresponding to a likely tail location.

Part IV presents wing panel normal force and center of pressure data for three rectangular wings of varying aspect ratio (span) at Mach numbers of 1.5 and 2.0.

NOMENCLATURE FOR TABULATED DATA OF APPENDIX A

$p_{t,o}$ or PTO	free stream stagnation (total) pressure	(in.Hg abs)
p_x	static or pitot pressure (see Fig. 2) taps 1-6, static; taps 7-15, pitot	(in.Hg abs.)
$p_x/p_{t,o}$	ratio of a probe pressure (static, p_s, or pitot, p_t') to free stream total pressure	
$\Delta p/q$	ratio of difference between local static and free stream static pressures to free stream dynamic pressure	
ϕ or ϕ_R	roll attitude of body or rake system; positive is clockwise looking upstream (see Fig. 3 for definition of ϕ or $\phi_R = 0$)	(degrees)
θ	location angle for y or a pitot rake; counterclockwise is positive looking upstream (see Figs. 3 and 4 for definition of $\theta = 0$)	(degrees)
α_i	indicated angle of attack in the vertical plane referred to tunnel centerline; nose up is positive	(degrees)
α_c	α_i corrected for support deflection	(degrees)
y	radial distance from body surface	(inches)

DISCUSSION

Source of Data

The flow field data of Part II provided a complete description of local static and total pressure distributions, local Mach number, and local flow inclination for angles of attack up to 23° at station ③ of the model described in Fig. 1. The M = 2.0 flow field tests (OAL 289-19)* provide data at station ③ for the B_5 body (termed B_{14} in the wind tunnel test report and in Part II) both alone and in combination with the W_4 wing, and at station ② for the B_5 body alone as described in Fig. 1. As noted in Part II, the complete flow field tests were conducted at M = 2.0 only.

To describe the Mach number effect, it will be necessary to draw from other tests conducted as part of the overall Generalized Missile Study (GMS) of the Bumblebee Program. During these tests (OAL 289-7, -8, -10, -11, -12)* a limited number of static and pitot pressure data were obtained at M = 1.5 and 2.0 at station ② (Fig. 1) for the B_5 body alone. This station approximates the leading edge of the W_4 wing employed in M = 2.0 flow field tests. These static and pitot pressure data and corresponding data from the OAL 289-19 flow field test at M = 2.0 have been reproduced and are presented as Appendix A. The page numbering is identical to that of the OAL reports.

A sketch of the model configuration, locations of the pressure taps on the rake, parameters used to define rake location, and the region of pressure coverage are shown in Figs. 1-4.

---

* The Ordnance Aerophysics Laboratory (OAL) wind tunnel tests from which the Part II and Part III data were obtained are:

1. Description of Complete Flow Field (Part II)

   OAL Report 289-14, -18, -19, "Survey of the Flow Field Around a Generalized-Missile Model at Mach 2.00," 19 April 1956.

2. Pressure Only (Part III)

   OAL Reports 289-7, -8, -10, -11, -12, "Investigation of Induced Roll and Longitudinal Stability Characteristics of a Generalized Missile Model at Mach Numbers of 1.5 and 2.0," 5 and 16 August 1955.

General Comments

Some notes concerning the interpretation of the tabulated pressure data in Appendix A follow.

- Pressures were measured in a plane normal to the body centerline at station (2) on the B_5 body (Fig. 1).
- Data that are not applicable for the purposes of this report have been crossed out.
- The maximum error in the measured pressure coefficients is quoted in OAL wind tunnel data reports as:

$$\Delta p/q = \pm 0.0058$$
$$p_x/p_{t_o} = \pm 0.0025$$

- Certain data sheets for the OAL 289-19, M = 2.0 test are believed to be in error. For the Rake 5 data listings:

$$y = 1.269, 1.469, 1.669, 1.869$$

should read

$$y = 1.069, 1.269, 1.469, 1.669$$

This correction has been made on the data sheets.

- The number 3 static pressure tap (see Fig. 2) for the OAL 289-7, -8, -10, M = 2.0 tests was found to be bad after the test data were published; hence, data listed for this tap should be disregarded. Data have been crossed out where necessary on the data sheets.
- A general statement is made in the OAL wind tunnel test reports that at high α on the leeward side of the body, some vibration of the pressure probes occurred. This statement implies that the data user should exercise discretion when interpreting data in these areas.
- Table I has been compiled as a data availability matrix for the pressure-only tests (OAL 289-7, -8, -10, -11, -12). The asterisk denotes where more than one run was made for the noted conditions.

As can be seen the matrix is nearly complete at M = 2.0 but not as complete at M = 1.5. However, coverage is complete at α = 20° and 23° at M = 1.5.

For the OAL 289-19, M = 2.0 test, the coverage was as follows:

$$\alpha_i = 0°,\ 4°,\ 8°,\ 12°,\ 16°,\ 20° \text{ and } 23°$$

$$\phi_R = \begin{cases} 30°,\ 15°,\ 0°,\ -15°,\ -30° \\ -40° \text{ through } -135° \text{ in } 5° \text{ increments} \\ \text{and } -150° \end{cases}$$

Data were obtained at each α for all values of ϕ_R.

Refer to Figs. 3 and 4 for a graphic description of location parameters and the region in which data were obtained.

It should be noted that all data given in Appendix A are presented as a function of wind tunnel indicated (or uncorrected) angle of attack, α_i. Corrected values of angle of attack, α_c, which include the effect of model support system deflection are given in the following table. These corrected values were obtained from the Stability and Control portions of Generalized Missile Study wind tunnel tests.

α_i (degrees)	α_c (degrees)		
	B_5 M = 1.5	B_5 M = 2.0	B_5W_4 M = 2.0
4	4.1	4.12	4.3
8	8.2	8.28	8.65
12	12.3	12.53	13.05
16	16.6	16.85	17.45
20	20.9	21.17	21.86
23	24.1	24.42	25.21

Examples

In order to assist the user of the data given in Appendix A, the following examples are given.

The following discussion will be concerned with pitot pressure data only since there are considerably more experimental data points giving pitot pressure than giving the static pressure. Also, it is the pitot pressure that would generally be more descriptive in helping to define the character of the flow field.

Since there are pressure data available from two different tests (see Figs. 3 and 4) at M = 2, the first example will be a comparison of these data.

Shown in Fig. 5 for $\alpha_i = 20°$ is p_t'/p_{t_o} versus distance from the body centerline (y + 0.685 in.) for $\theta = 90°$, 120°, and 150° which, as noted in Fig. 4, is an area where data were obtained with three different pitot pressure rakes. The curves drawn through these points represent an average value of p_t'/p_{t_o} at any given distance from the body centerline. This single curve representation of the data is probably a good one except possibly in regions of extreme flow activity such as shown in Fig. 5(c), $\theta = 150°$, which, as will be noted subsequently, is in the area of a body vortex.

To exemplify where the plotted data points are given in the tabulated data of Appendix A, refer to Fig. 5(b), $\theta = 120°$, and Figs. 3 and 4.

1. Pressure only test, OAL 289-7.

The checked data set for $\phi = -30°$ on page 550 gives the circles plotted on Fig. 5(b). Taps 7 through 15 apply and p_x stands for p_t'.

2. Flow Field test, OAL 289-19.

Rake 1, $\phi_R = 0°$ - The checked data sets on pages 233 and 256 are plotted as the flagged squares in Fig. 5(b).

Rake 5, $\phi_R = -120°$ - The checked data sets on pages 328, 351, and 374 are plotted as the squares in Fig. 5(b). Note that, although data are given to values of y = 3.469, data were not plotted beyond y = 2.069

since that is the extent to which data were available from the pressure-only tests.

The variation of p_t'/p_{t_o} with Mach number (M = 1.5 and 2.0) at $\alpha_i = 20°$ is exemplified in Fig. 6. The pressure-only tests were used for this comparison.

A typic' windward variation is given in Fig. 6(a) for $\theta = 30°$. As might be expected, the variation of p_t'/p_{t_o} with distance from the body is nearly constant.

A typical leeward variation of p_t'/p_{t_o} at $\theta = 150°$ is given in Fig. 6(b).

An example of how these pitot pressure data can be used to aid in defining the flow field about the body is given by a comparison of Figs. 5(c), 6(b), and Fig. 7 which made use of Fig. 24 from Ref. 1.

A $\theta = 150°$ line and lines of constant distance from the body centerline have been drawn on the total pressure ratio contour of Fig. 7. Note that $H_1/H_o = p_{t_1}/p_{t_o}$ or local total pressure ratio and not pitot pressure ratio. Refer now to Fig. 5(c) and note that the minimum pitot pressure occurs at a distance of 1.2 inches from the body centerline or as a multiple of the body radius (0.685 inches) at a value of approximately 1.75. Although $\theta = 150°$ is not the exact circumferential location of the body vortex, it can be seen that the radial location is approximately 1.75 body radii from the centerline of the body. The data in Fig. 6(b) indicate that the body vortex at M = 1.5, $\alpha_i = 20°$ may be in the same approximate position as at M = 2.0. Additional p_t'/p_{t_o} plots would be required to determine an exact location.

CONCLUDING REMARKS

In summary, this report provides data (specifically pitot pressure ratios) to describe the effect of Mach number (M = 1.5 and 2.0) on the flow field about a body at a mid-body longitudinal station. The existence of significantly reduced pressure regions on the leeward side of a body at high angles of attack (to α = 23°) where a wing may be positioned at certain roll orientations is readily discernible.

REFERENCE

1. APL/JHU CM-867, "Investigation of Normal-Force Distributions and Wake Vortex Characteristics of Bodies of Revolution at Supersonic Speeds," J. F. Mello, McDonnell Aircraft Corporation, 2 April 1956.

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TABLE I

Data Availability Matrix

M = 1.5 and 2.0

(OAL 289-7, -8, -10, -11, -12)

M = 1.5

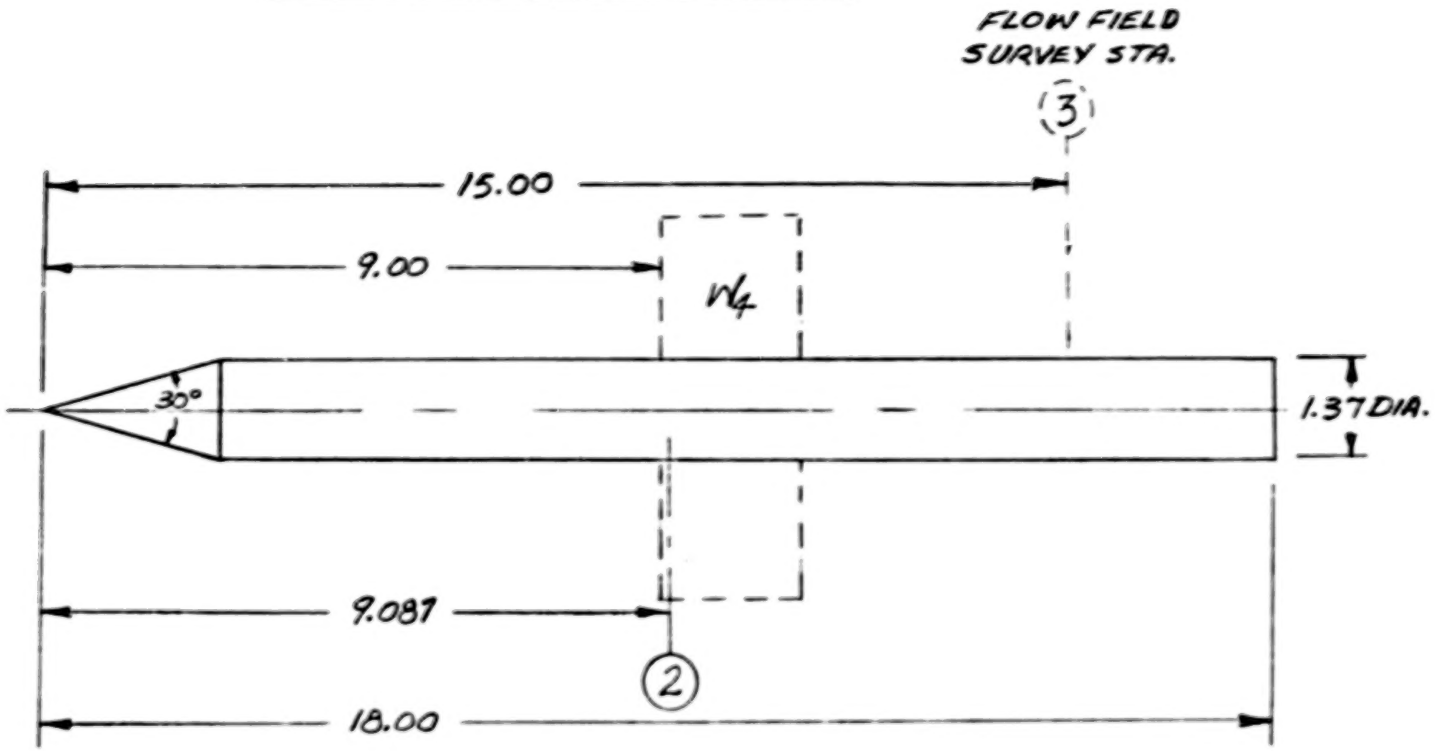
α_i° \ Ø°	90	75	60	45	30	15	0	-15	-30	-35	-40	-45	-50	-55	-60	-65	-70	-75	-80	-90	-105	-120	-135	-150	-165	-180
0							X													X						X
4	X	X	X							X	X		X	X		X	X		X					X	X	X
8	X	X	X							X	X		X	X		X	X		X					X	X	X
12	X	X	X							X	X		X	X		X	X		X					X	X	X
16	X	X	X							X	X		X	X		X	X		X					X	X	X
20	X	X	X	X	X	X	X	X*	X*	X*	X*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

M = 2.0

α_i° \ Ø°	90	75	60	45	30	15	0	-15	-30	-35	-40	-45	-50	-55	-60	-65	-70	-75	-80	-90	-105	-120	-135	-150	-165	-180
0	X	X	X	X*	X	X	X*	X	X			X*			X					X*	X*	X*	X*			
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X*	X	X			X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X*	X	X			X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X*	X	X			X*	X*	X*	X*	X	X	X
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X*	X	X			X	X	X	X	X	X	X
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X*	X	X			X	X	X	X	X	X	X
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X*	X	X	X		X	X	X	X	X	X	X

* More than one run

PRESSURE SURVEY MODEL



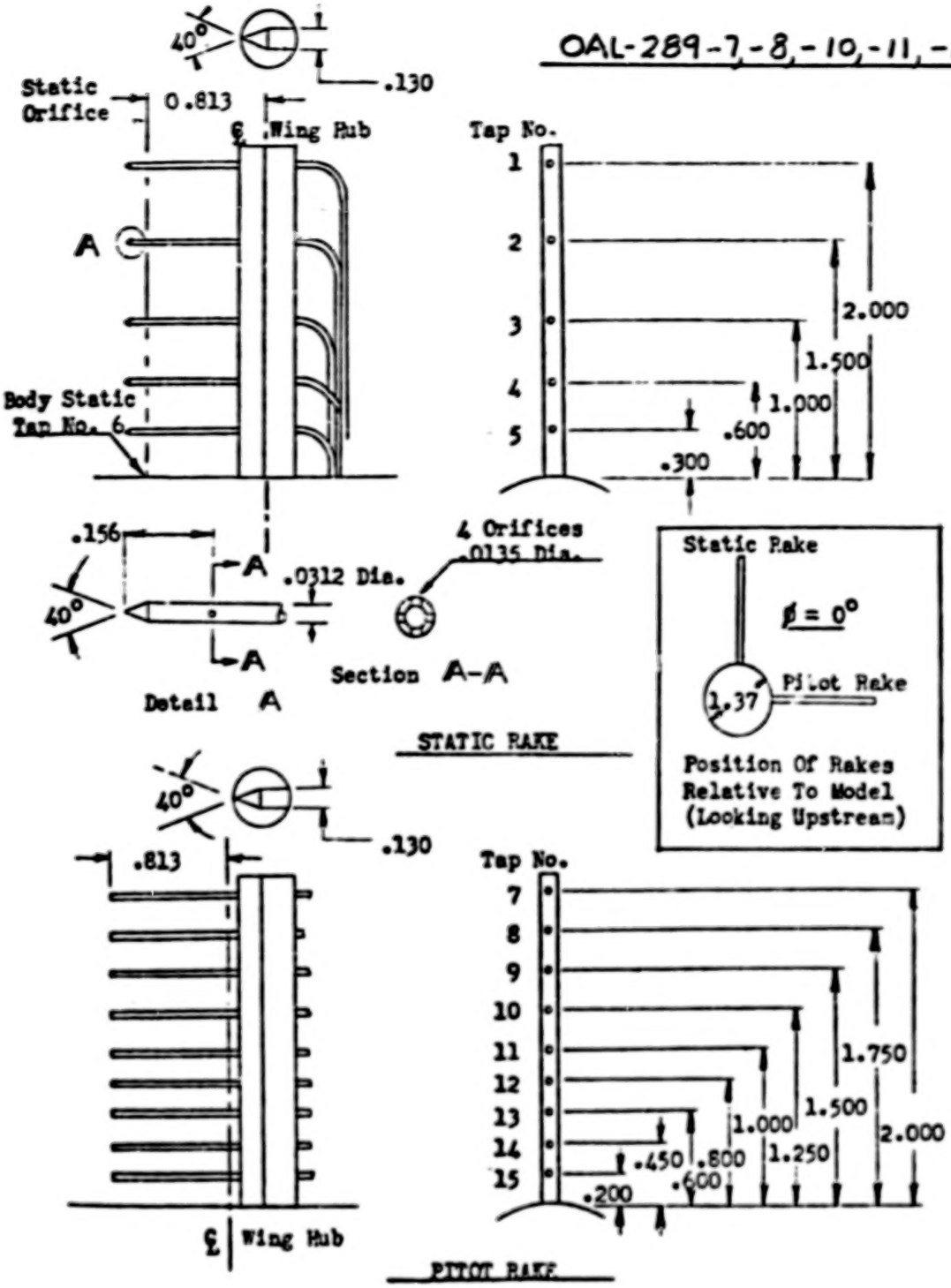
B5P

NOTES:

1. STA. (2) - LOCATION OF PRESSURE ORIFICES.
2. DIMENSIONS IN INCHES.

FIG. 1

OAL-289-7,-8,-10,-11,-12



GENERALIZED MISSILE PRESSURE RAKES

FIG. 2

PRESSURE RAKE ORIENTATION

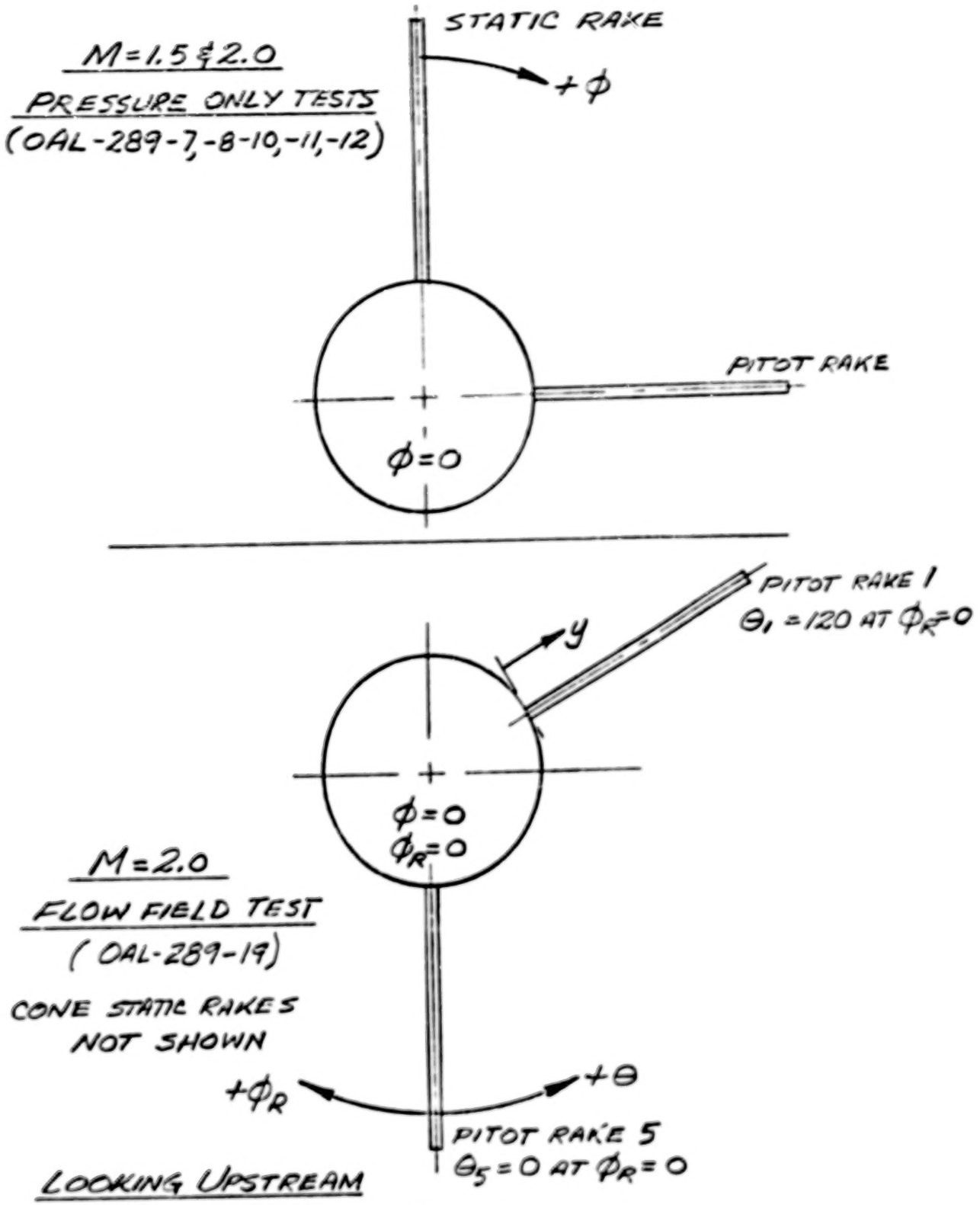


FIG. 3

REGION OF PITOT PRESSURE COVERAGE

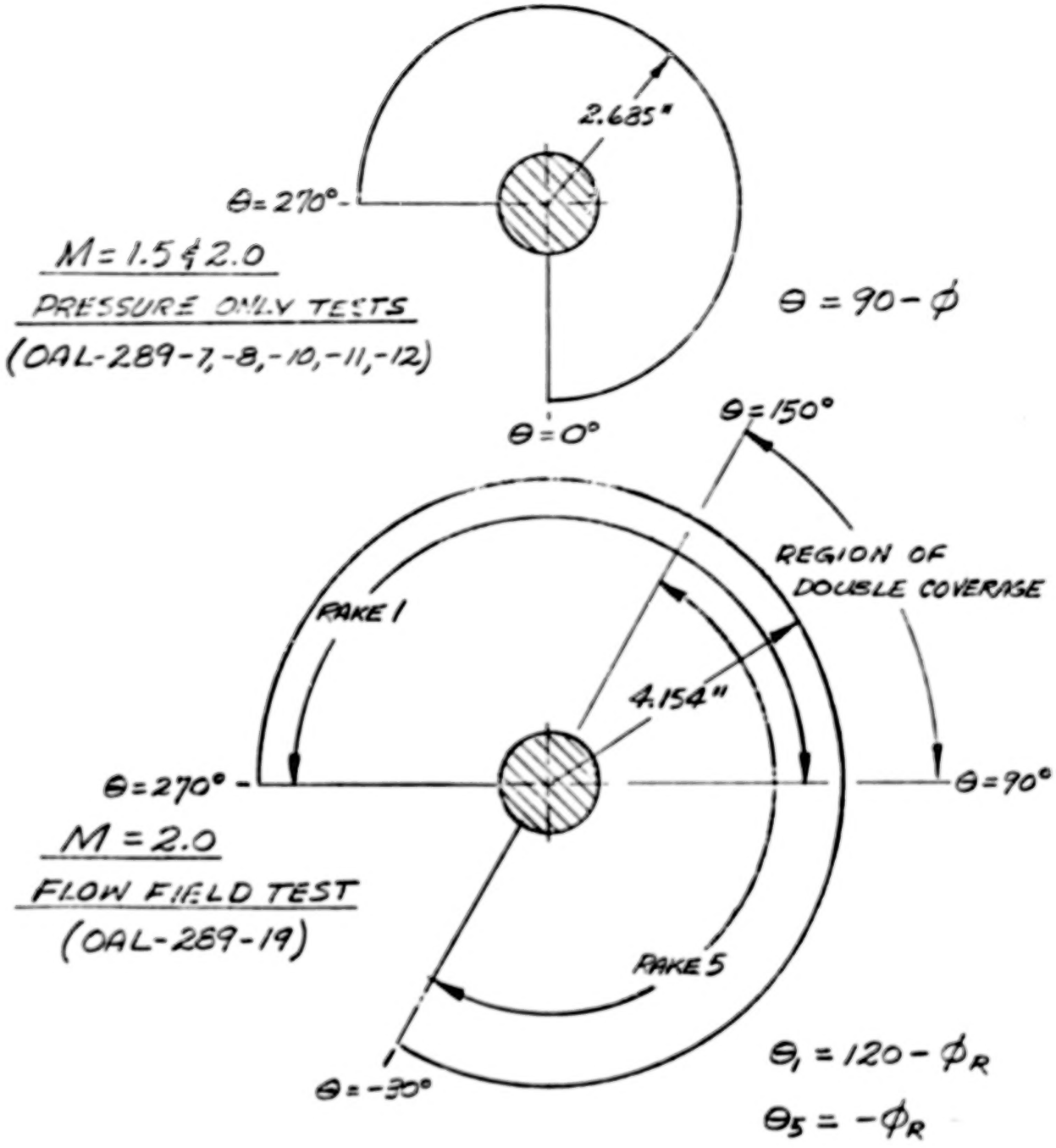


FIG. 4

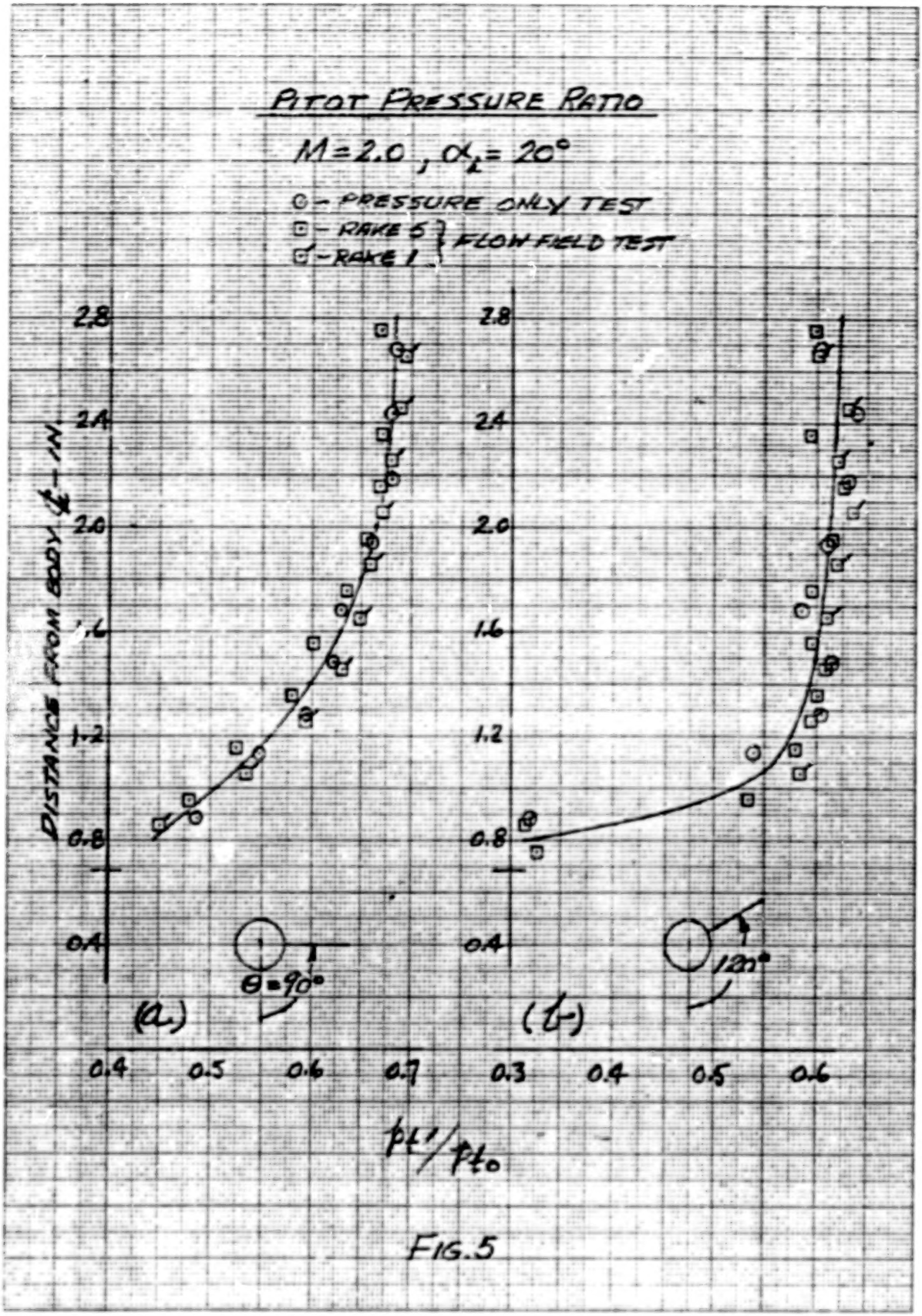

PITOT PRESSURE RATIO
M=2.0 , α_1 = 20°
⊙ - PRESSURE ONLY TEST
⊡ - RAKE 5
⊡ - RAKE 1
} FLOW FIELD TEST
DISTANCE FROM BODY (r - IN.
2.8
2.4
2.0
1.6
1.2
0.8
0.4
θ=90°
120°
(a.)
(b.)
0.4
0.5
0.6
0.7
0.3
0.4
0.5
0.6
p_{t_1}/p_{t_0}

FIG. 5

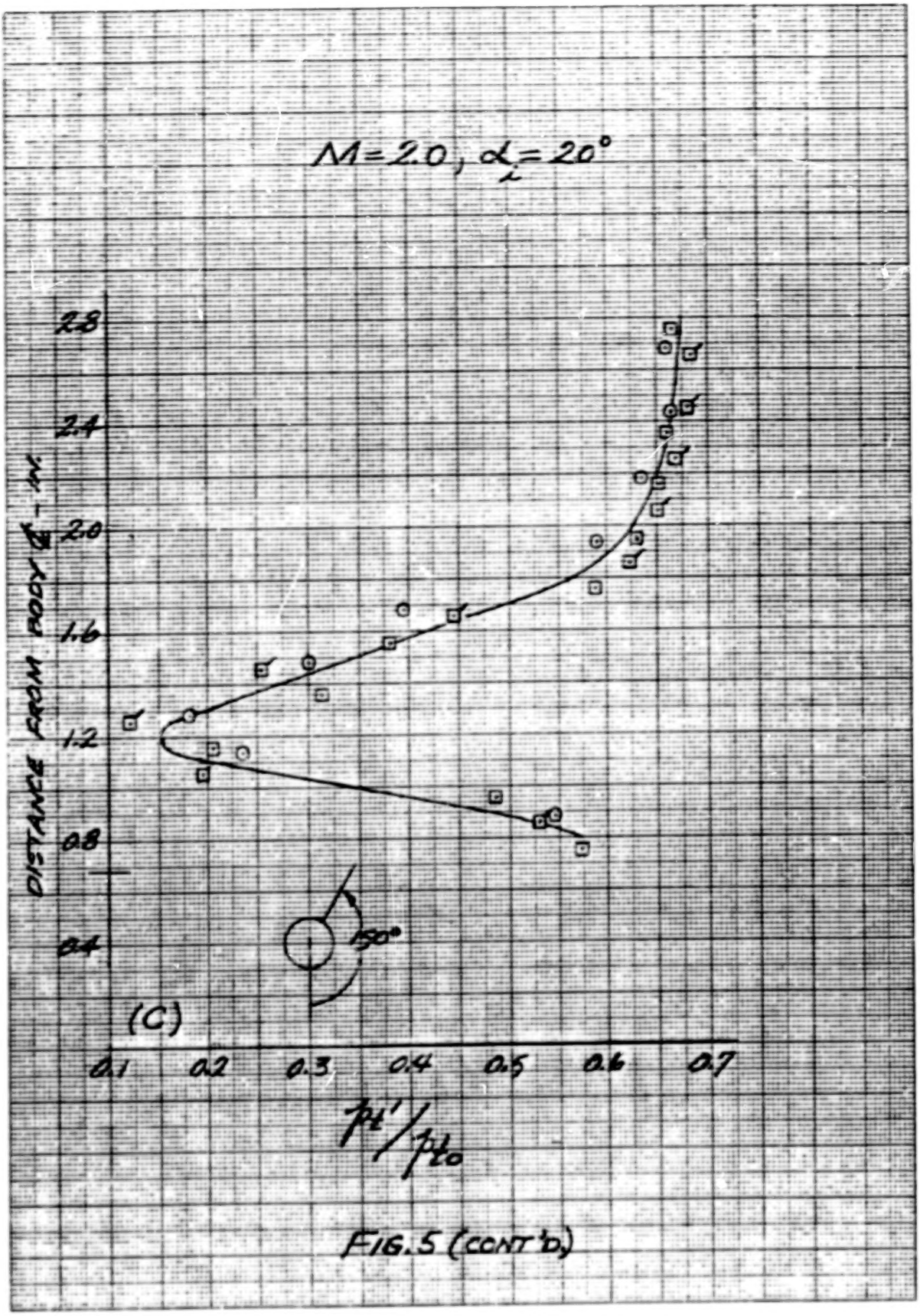

M=2.0, α_i=20°
DISTANCE FROM BODY SURFACE - IN.
2.8
2.4
2.0
1.6
1.2
0.8
0.4
150°
(C)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
p_t'/p_t0

FIG. 5 (CONT'D)

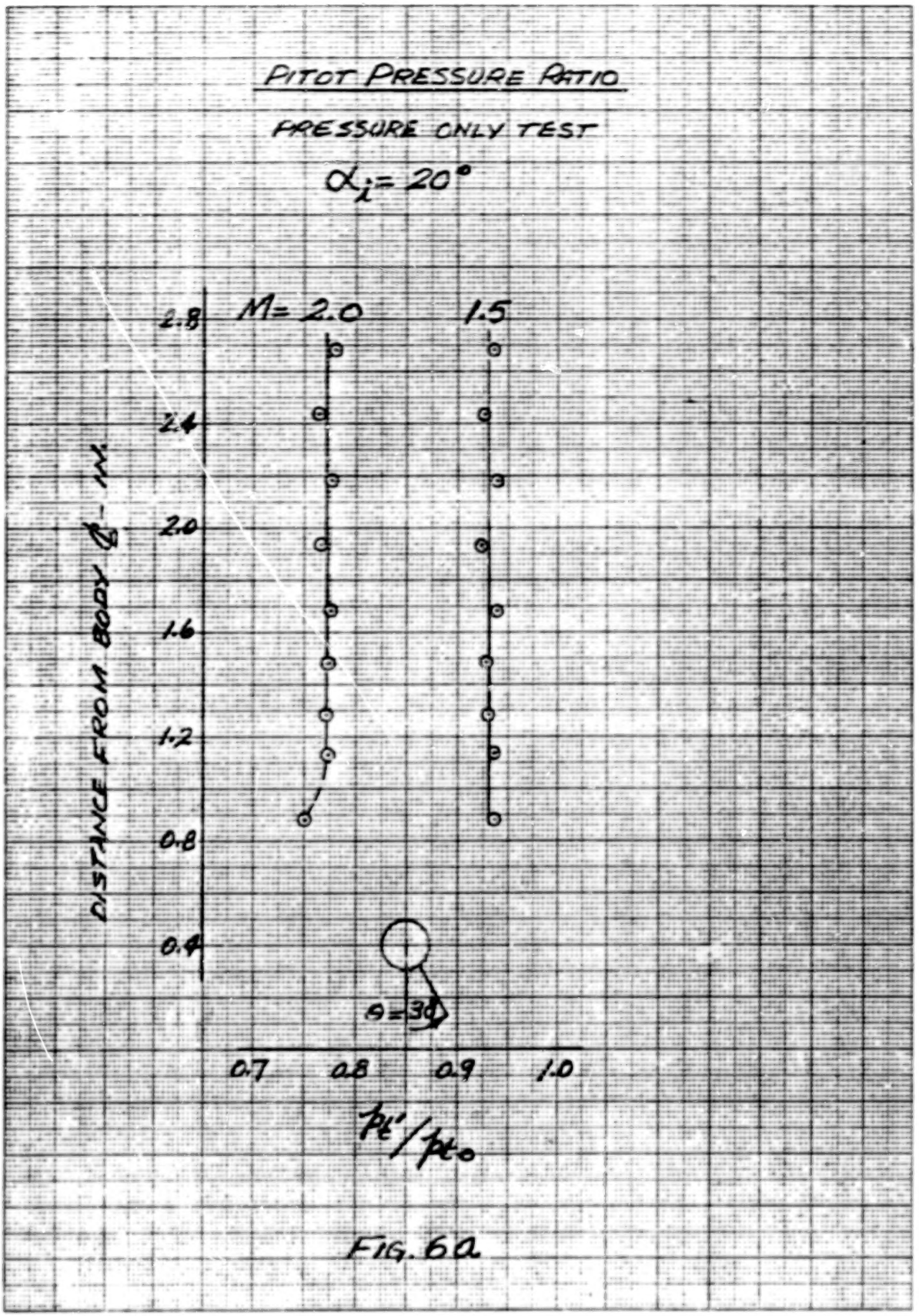

PITOT PRESSURE RATIO
PRESSURE ONLY TEST
$\alpha_i = 20°$
M = 2.0
1.5
2.8
2.4
2.0
1.6
1.2
0.8
0.4
DISTANCE FROM BODY - M
θ = 30
0.7
0.8
0.9
1.0
p_t'/p_{t_0}

FIG. 6a

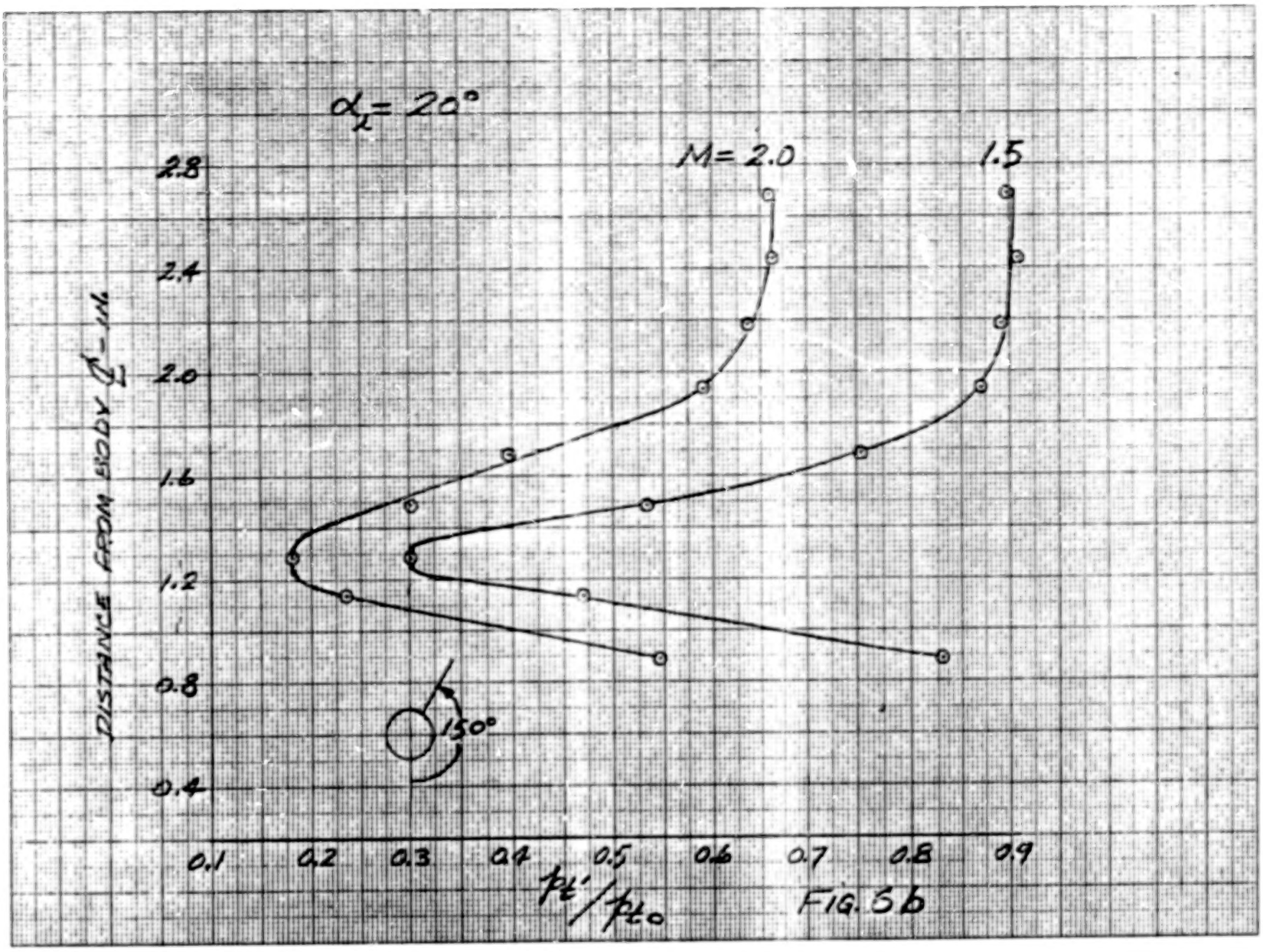

$\alpha_L = 20°$
M = 2.0
1.5
2.8
2.4
2.0
1.6
1.2
0.8
0.4
DISTANCE FROM BODY $\frac{r}{L} - 1/L$
150°
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
$p_{t'}/p_{t_0}$

FIG. 5b

EXPERIMENTAL TOTAL PRESSURE RATIO CONTOURS AND LOCAL FLOW INCLINATION

$M_\infty = 2.00$ $\alpha_B = 20°$ STATION 2

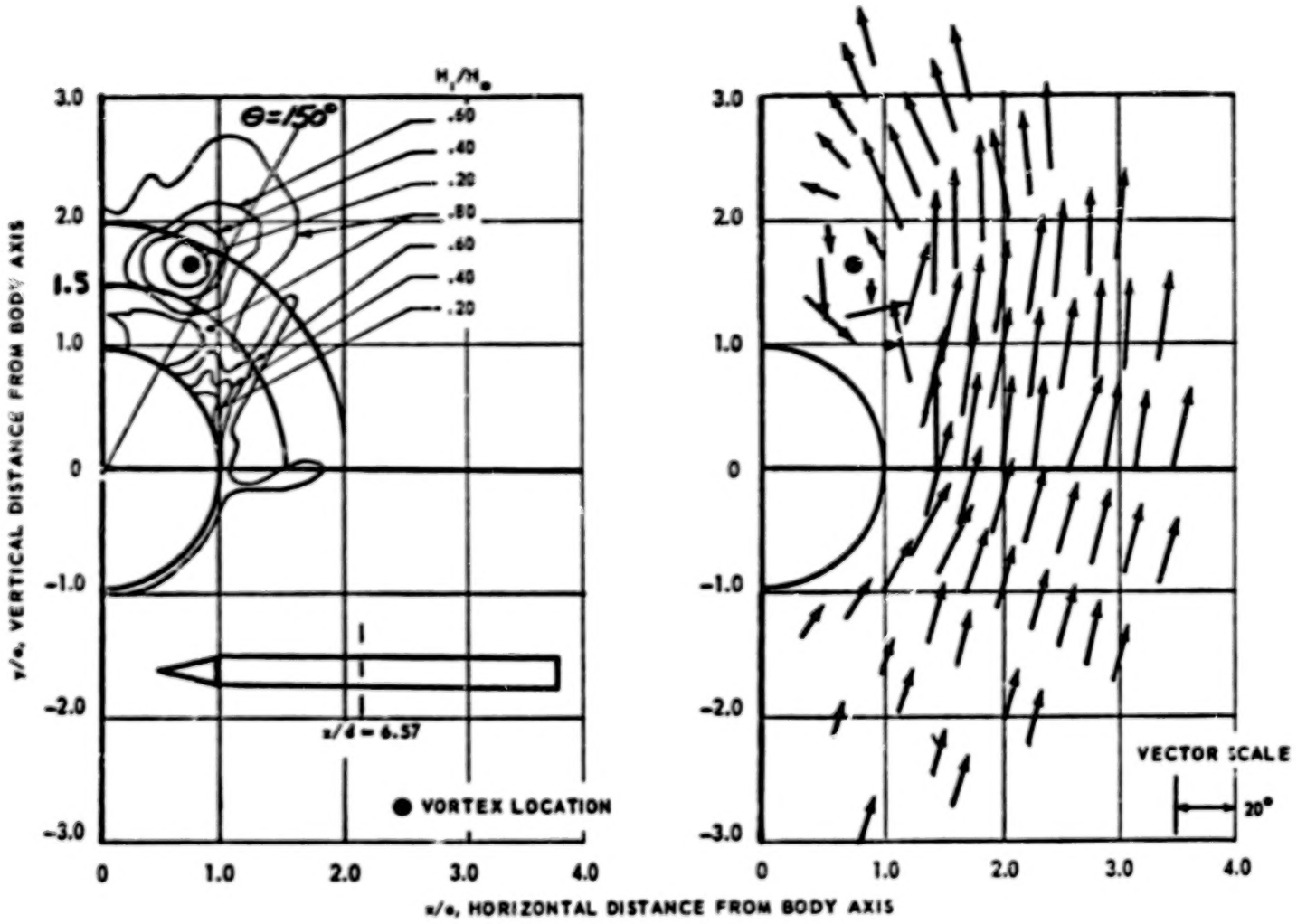


FIG. 7

APPENDIX - A

TABULATED PRESSURE DATA

M = 1.5

OAL 289-11, Runs 2,3,5, $\emptyset$ = 90 to -180 (pp. 72-109)

M = 2.0

OAL 289-12, Run 15, $\emptyset$ = 0 to +90 (pp. 151-158)

OAL 289-7, Run 27, $\emptyset$ = +45 to -45 (pp. 537-553)

OAL 289-8, Runs 35, 36, $\emptyset$ = -60 to -135 (pp. 554-573)

OAL 289-10, Run 29, $\emptyset$ = -35 to -180 (pp. 585-606)

OAL 289-19, Runs 1,2,3, $\emptyset_R$ = +30 to -150 (pp. 233-397 not inclusive, 32 pages in all)

NOTE:

Page numbering from the OAL wind tunnel test reports has been retained.

OAL 289-11

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.63		000.0	00.0	1	?	289-11
01	.3676	0.222					
02	.2669	-0.013					
03	.2632	-0.021					
04	.2632	-0.021					
05	.2669	-0.013					
06	.2999	0.064					
07	.9240						
08	.9259						
09	.9205						
10	.9277						
11	.9222						
12	.9259						
13	.9259						
14	.9259						
15	.9240						

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APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	β	α_1	Pic	Run	Test
PTO	54.48		-090.0	00.0	2	?	289-11
01	.3531	0.211					
02	.2603	-0.028					
03	.2529	-0.045					
04	.2529	-0.045					
05	.2584	-0.033					
06	.3025	0.070					
07	.9302						
08	.9302						
09	.9321						
10	.9321						
11	.9766						
12	.9321						
13	.9302						
14	.9302						
15	.9302						
PTO	54.88		-180.0	00.0	3	?	289-11
01	.3595	0.203					
02	.2611	-0.026					
03	.2593	-0.031					
04	.2593	-0.031					
05	.2684	-0.009					
06	.2994	0.063					
07	.9244						
08	.9244						
09	.9244						
10	.9244						
11	.9207						
12	.9244						
13	.9244						
14	.9244						
15	.9226						
PTO	54.68		060.0	04.0	4	?	289-11
01	.3553	0.193					
02	.2584	-0.033					
03	.2511	-0.050					
04	.2438	-0.067					
05	.2548	-0.041					
06	.2712	-0.003					
07	.9223						
08	.9204						
09	.9204						
10	.9223						
11	.9223						
12	.9204						
13	.9241						
14	.9241						
15	.9241						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.68		075.0	04.0	5	7	289-11
01	.3499	0.181					
02	.2584	-0.033					
03	.2474	-0.058					
04	.2438	-0.067					
05	.2493	-0.054					
06	.2804	0.019					
07	.9186						
08	.9186						
09	.9168						
10	.9241						
11	.9259						
12	.9241						
13	.9241						
14	.9241						
15	.9241						
PTO	54.58		090.0	04.0	6	7	289-11
01	.3496	0.180					
02	.2580	-0.034					
03	.2470	-0.059					
04	.2451	-0.064					
05	.2488	-0.055					
06	.2891	0.039					
07	.9249						
08	.9249						
09	.9230						
10	.9230						
11	.9267						
12	.9285						
13	.9267						
14	.9267						
15	.9267						
PTO	54.58		-035.0	04.0	7	7	289-11
01	.3551	0.193					
02	.2653	-0.017					
03	.2653	-0.017					
04	.2598	-0.029					
05	.2653	-0.017					
06	.2653	-0.017					
07	.9267						
08	.9285						
09	.9285						
10	.9267						
11	.9249						
12	.9249						
13	.9249						
14	.9249						
15	.9249						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic	Run	Test
PTO	54.58		-040.0	04.0	8	2	289-11
01	.3578	0.199					
02	.2552	-0.040					
03	.2526	-0.073					
04	.2589	-0.031					
05	.2526	-0.073					
06	.2662	-0.014					
07	.9276						
08	.9276						
09	.9258						
10	.9258						
11	.9240						
12	.9240						
13	.9258						
14	.9258						
15	.9258						
PTO	54.48		-050.0	04.0	9	2	289-11
01	.3622	0.209					
02	.2557	-0.039					
03	.2557	-0.039					
04	.2594	-0.030					
05	.2594	-0.030					
06	.2722						
07	.9275						
08	.9293						
09	.9275						
10	.9257						
11	.9238						
12	.9275						
13	.9275						
14	.9275						
15	.9275						
PTO	54.48		-055.0	04.0	10	2	289-11
01	.3622	0.209					
02	.2557	-0.039					
03	.2539	-0.043					
04	.2557	-0.039					
05	.2575	-0.035					
06	.2759	0.008					
07	.9275						
08	.9275						
09	.9275						
10	.9238						
11	.9238						
12	.9293						
13	.9275						
14	.9275						
15	.9275						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.48		-065.0	04.0	11	?	289-11
01	.3640	0.714					
02	.2575	-0.035					
03	.2520	-0.048					
04	.2520	-0.049					
05	.2520	-0.048					
06	.2814	0.021					
07	.9257						
08	.9257						
09	.9275						
10	.9275						
11	.9275						
12	.9275						
13	.9275						
14	.9275						
15	.9275						
PTO	54.43		-070.0	04.0	12	?	289-11
01	.3643	0.714					
02	.2578	-0.034					
03	.2523	-0.047					
04	.2523	-0.047					
05	.2523	-0.047					
06	.2835	0.026					
07	.9283						
08	.9302						
09	.9283						
10	.9283						
11	.9283						
12	.9283						
13	.9283						
14	.9283						
15	.9265						
PTO	54.43		-080.0	04.0	13	?	289-11
01	.3662	0.719					
02	.2559	-0.038					
03	.2523	-0.047					
04	.2523	-0.047					
05	.2504	-0.051					
06	.2890	0.039					
07	.9302						
08	.9283						
09	.9283						
10	.9283						
11	.9283						
12	.9283						
13	.9320						
14	.9357						
15	.9283						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic	Run	Test
PTO	54.43		-150.0	04.0	14	?	289-11
01	.3652	0.216					
02	.2532	-0.045					
03	.2642	-0.019					
04	.2642	-0.019					
05	.2660	-0.015					
06	.3156	0.101					
07	.9256						
08	.9256						
09	.9256						
10	.9256						
11	.9164						
12	.9256						
13	.9274						
14	.9256						
15	.9238						
PTO	54.48		-165.0	04.0	15	?	289-11
01	.3768	0.243					
02	.2649	-0.017					
03	.2667	-0.013					
04	.2630	-0.022					
05	.2667	-0.013					
06	.3181	0.107					
07	.9238						
08	.9238						
09	.9238						
10	.9238						
11	.9165						
12	.9238						
13	.9238						
14	.9220						
15	.9202						
PTO	54.43		-180.0	04.0	16	?	289-11
01	.3698	0.227					
02	.2559	-0.038					
03	.2578	-0.034					
04	.2559	-0.038					
05	.2614	-0.026					
06	.3202	0.111					
07	.9210						
08	.9228						
09	.9210						
10	.9228						
11	.9192						
12	.9210						
13	.9210						
14	.9210						
15	.9192						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic Run Test
PTO	54.33		060.0	08.0	17 7 289-11
01	.3503	0.182			
02	.2472	-0.059			
03	.2343	-0.089			
04	.2251	-0.110			
05	.2343	-0.089			
06	.2656	-0.016			
07	.9209				
08	.9209				
09	.9190				
10	.9172				
11	.9209				
12	.9227				
13	.9227				
14	.9245				
15	.9227				
PTO	54.33		075.0	08.0	18 7 289-11
01	.3484	0.177			
02	.2454	-0.063			
03	.2325	-0.093			
04	.2288	-0.102			
05	.2251	-0.110			
06	.2785	0.014			
07	.9190				
08	.9172				
09	.9172				
10	.9209				
11	.9245				
12	.9227				
13	.9264				
14	.9264				
15	.9264				
PTO	54.28		090.0	08.0	19 7 289-11
01	.3359	0.148			
02	.2493	-0.054			
03	.2308	-0.097			
04	.2272	-0.105			
05	.2179	-0.127			
06	.2824	0.023			
07	.9217				
08	.9217				
09	.9217				
10	.9217				
11	.9217				
12	.9162				
13	.9272				
14	.9272				
15	.9272				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.33		-035.0	08.0	20	2	289-11
01	.3558	0.194					
02	.2564	-0.037					
03	.2527	-0.046					
04	.2490	-0.055					
05	.2251	-0.110					
06	.2601	-0.029					
07	.9301						
08	.9282						
09	.9264						
10	.9245						
11	.9227						
12	.9245						
13	.9227						
14	.9227						
15	.9227						
PTO	54.33		-040.0	08.0	21	2	289-11
01	.3595	0.203					
02	.2527	-0.046					
03	.2527	-0.046					
04	.2472	-0.059					
05	.2196	-0.123					
06	.2601	-0.029					
07	.9282						
08	.9282						
09	.9264						
10	.9227						
11	.9227						
12	.9227						
13	.9245						
14	.9209						
15	.9227						
PTO	54.28		-050.0	08.0	22	2	289-11
01	.3635	0.212					
02	.2474	-0.058					
03	.2437	-0.067					
04	.2456	-0.062					
05	.2382	-0.080					
06	.2622	-0.024					
07	.9272						
08	.9272						
09	.9272						
10	.9235						
11	.9272						
12	.9272						
13	.9272						
14	.9235						
15	.8333						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic Run Test
PTO	54.28		-055.0	08.0	23 ? 289-11
01	.3653	0.217			
02	.2474	-0.058			
03	.2437	-0.067			
04	.2419	-0.071			
05	.2345	-0.088			
06	.2640	-0.020			
07	.9272				
08	.9272				
09	.9254				
10	.9235				
11	.9272				
12	.9272				
13	.9272				
14	.9235				
15	.7504				
PTO	54.23		-065.0	08.0	24 ? 289-11
01	.3730	0.234			
02	.2476	-0.058			
03	.2421	-0.071			
04	.2384	-0.079			
05	.2274	-0.105			
06	.2753	0.007			
07	.9299				
08	.9299				
09	.9299				
10	.9281				
11	.9281				
12	.9318				
13	.9299				
14	.9299				
15	.7105				
PTO	54.33		-070.0	08.0	25 ? 289-11
01	.3742	0.237			
02	.2490	-0.055			
03	.2417	-0.072			
04	.2380	-0.080			
05	.2251	-0.110			
06	.2785	0.014			
07	.9301				
08	.9301				
09	.9301				
10	.9282				
11	.9282				
12	.9301				
13	.9301				
14	.9319				
15	.7736				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic	Run	Test
PTO	54.38		-080.0	08.0	26	2	289-11
01	.3766	0.243					
02	.2497	-0.053					
03	.2405	-0.074					
04	.2387	-0.079					
05	.2203	-0.121					
06	.2828	0.024					
07	.9301						
08	.9320						
09	.9338						
10	.9320						
11	.9339						
12	.9356						
13	.9338						
14	.9338						
15	.9264						
PTO	54.33		-150.0	08.0	27	2	289-11
01	.3760	0.241					
02	.2380	-0.080					
03	.2490	-0.055					
04	.2619	-0.024					
05	.2674	-0.012					
06	.3263	0.126					
07	.9245						
08	.9227						
09	.9227						
10	.9227						
11	.9227						
12	.9245						
13	.9227						
14	.9190						
15	.9153						
PTO	54.33		-165.0	08.0	28	2	289-11
01	.3825	0.257					
02	.2555	-0.039					
03	.2592	-0.031					
04	.2665	-0.014					
05	.2702	-0.005					
06	.3125	0.093					
07	.9236						
08	.9236						
09	.9236						
10	.9236						
11	.9163						
12	.9236						
13	.9199						
14	.9163						
15	.9107						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.33		-180.0	08.0	29	?	289-11
01	.3751	0.239					
02	.2500	-0.052					
03	.2518	-0.048					
04	.2573	-0.035					
05	.2647	-0.018					
06	.3033	0.072					
07	.9236						
08	.9218						
09	.9199						
10	.9236						
11	.9199						
12	.9199						
13	.9199						
14	.9163						
15	.9089						
PTO	54.33		060.0	12.0	30	?	289-11
01	.3374	0.152					
02	.2269	-0.106					
03	.2159	-0.132					
04	.1938	-0.183					
05	.1901	-0.192					
06	.2564	-0.037					
07	.9209						
08	.9153						
09	.9172						
10	.9117						
11	.9117						
12	.9117						
13	.9209						
14	.9227						
15	.9227						
PTO	54.28		075.0	12.0	31	?	289-11
01	.3432	0.165					
02	.2272	-0.105					
03	.2161	-0.131					
04	.2014	-0.165					
05	.2032	-0.161					
06	.2622	-0.024					
07	.9217						
08	.9162						
09	.9199						
10	.9180						
11	.9199						
12	.9180						
13	.9235						
14	.9272						
15	.9291						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.28		090.0	12.0	32	?	289-11
01	.3285	0.131					
02	.2327	-0.093					
03	.2143	-0.135					
04	.2014	-0.165					
05	.1922	-0.187					
06	.2511	-0.050					
07	.9254						
08	.9235						
09	.9235						
10	.9217						
11	.9217						
12	.9199						
13	.9254						
14	.9291						
15	.9309						
PTO	54.48		-035.0	12.0	33	?	289-11
01	.3493	0.179					
02	.2520	-0.048					
03	.2300	-0.099					
04	.2098	-0.146					
05	.2043	-0.159					
06	.2594	-0.030					
07	.9202						
08	.9275						
09	.9238						
10	.9183						
11	.9128						
12	.9165						
13	.9110						
14	.9018						
15	.9073						
PTO	54.48		-045.0	12.0	34	?	289-11
01	.3539	0.190					
02	.2456	-0.062					
03	.2309	-0.097					
04	.2107	-0.144					
05	.2217	-0.118					
06	.2529	-0.045					
07	.9229						
08	.9284						
09	.9247						
10	.9229						
11	.9137						
12	.9174						
13	.9119						
14	.8990						
15	.6274						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.38		-050.0	12.0	35	2	289-11
01	.3610	0.207					
02	.2341	-0.089					
03	.2212	-0.119					
04	.2083	-0.149					
05	.1936	-0.184					
06	.2488	-0.055					
07	.9218						
08	.9255						
09	.9218						
10	.9255						
11	.9182						
12	.9200						
13	.9127						
14	.8887						
15	.5890						
PTO	54.33		-055.0	12.0	36	2	289-11
01	.3632	0.212					
02	.2288	-0.102					
03	.2196	-0.123					
04	.2049	-0.157					
05	.1846	-0.205					
06	.2509	-0.050					
07	.9227						
08	.9264						
09	.9264						
10	.9282						
11	.9209						
12	.9227						
13	.9153						
14	.8877						
15	.4846						
PTO	54.38		-065.0	12.0	37	2	289-11
01	.3665	0.219					
02	.2304	-0.098					
03	.2212	-0.119					
04	.2047	-0.158					
05	.1955	-0.179					
06	.2580	-0.034					
07	.9255						
08	.9292						
09	.9292						
10	.9292						
11	.9218						
12	.9274						
13	.9237						
14	.9200						
15	.5375						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic Run Test
PTO	54.38		-070.0	12.0 38	? 289-11
01	.3693	0.226			
02	.2313	-0.096			
03	.2221	-0.117			
04	.2056	-0.156			
05	.1927	-0.186			
06	.2608	-0.027			
07	.9264				
08	.9301				
09	.9301				
10	.9301				
11	.9264				
12	.9320				
13	.9320				
14	.9264				
15	.7021				
PTO	54.33		-080.0	12.0 39	? 289-11
01	.3742	0.237			
02	.2306	-0.097			
03	.2196	-0.123			
04	.2085	-0.149			
05	.1865	-0.200			
06	.2601	-0.029			
07	.9337				
08	.9337				
09	.9337				
10	.9337				
11	.9301				
12	.9337				
13	.9337				
14	.9319				
15	.9245				
PTO	54.33		-150.0	12.0 40	? 289-11
01	.3816	0.255			
02	.2251	-0.110			
03	.2306	-0.097			
04	.2509	-0.050			
05	.2564	-0.037			
06	.3116	0.091			
07	.9227				
08	.9227				
09	.9172				
10	.9209				
11	.9172				
12	.9190				
13	.9117				
14	.9024				
15	.8988				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta p}{q}$	ϕ	c_i	Pic	Run	Test
PTO	54.33		-165.0	12.0	41	?	289-11
01	.3880	0.269					
02	.7426	-0.069					
03	.7408	-0.074					
04	.7610	-0.027					
05	.7702	-0.005					
06	.3144	0.098					
07	.9218						
08	.9199						
09	.9163						
10	.9199						
11	.9144						
12	.9199						
13	.9107						
14	.9034						
15	.8960						
PTO	54.33		-180.0	12.0	42	?	289-11
01	.3742	0.237					
02	.7380	-0.080					
03	.7343	-0.089					
04	.7527	-0.046					
05	.7693	-0.007					
06	.3135	0.096					
07	.9190						
08	.9153						
09	.9117						
10	.9153						
11	.9117						
12	.9117						
13	.9117						
14	.9043						
15	.8859						
PTO	54.33		060.0	16.0	43	?	289-11
01	.3236	0.119					
02	.1966	-0.177					
03	.1708	-0.227					
04	.1542	-0.275					
05	.2150	-0.134					
06	.2095	-0.147					
07	.9273						
08	.9218						
09	.9255						
10	.9163						
11	.9218						
12	.9199						
13	.9236						
14	.9255						
15	.9255						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic	Run	Test
PTO	54.38		075.0	16.0	44	?	289-11
01	.3233	0.119					
02	.2056	-0.156					
03	.1798	-0.216					
04	.1578	-0.267					
05	.1615	-0.258					
06	.2442	-0.066					
07	.9301						
08	.9228						
09	.9320						
10	.9246						
11	.9283						
12	.9264						
13	.9320						
14	.9356						
15	.9375						
PTO	54.38		090.0	16.0	45	?	289-11
01	.3086	0.084					
02	.2166	-0.130					
03	.1890	-0.194					
04	.1762	-0.224					
05	.1743	-0.229					
06	.2442	-0.066					
07	.9338						
08	.9301						
09	.9320						
10	.9264						
11	.9301						
12	.9283						
13	.9356						
14	.9393						
15	.9430						
PTO	54.38		-035.0	16.0	46	?	289-11
01	.3380	0.153					
02	.2313	-0.096					
03	.1909	-0.190					
04	.1063	-0.387					
05	.1063	-0.387					
06	.2313	-0.096					
07	.9081						
08	.9172						
09	.9081						
10	.9044						
11	.8786						
12	.8803						
13	.8455						
14	.7278						
15	.4961						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic Run Test
PTO	54.38		-040.0	16.0	47 ? 289-11
01	.3380	0.153			
02	.2166	-0.130			
03	.1762	-0.224			
04	.1210	-0.353			
05	.1210	-0.353			
06	.2405	-0.074			
07	.9099				
08	.9191				
09	.9117				
10	.9081				
11	.8841				
12	.8823				
13	.8051				
14	.5734				
15	.6764				
PTO	54.38		-050.0	16.0	48 ? 289-11
01	.3472	0.174			
02	.2093	-0.147			
03	.1762	-0.224			
04	.1670	-0.246			
05	.2056	-0.156			
06	.2258	-0.109			
07	.9117				
08	.9209				
09	.9154				
10	.9135				
11	.8915				
12	.8860				
13	.8051				
14	.4373				
15	.4557				
PTO	54.38		-055.0	16.0	49 ? 289-11
01	.3509	0.183			
02	.2056	-0.156			
03	.1780	-0.220			
04	.1798	-0.216			
05	.1909	-0.190			
06	.2166	-0.130			
07	.9172				
08	.9228				
09	.9191				
10	.9154				
11	.9007				
12	.8970				
13	.8345				
14	.4961				
15	.4741				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic Run Test
PTO	54.43		-065.0	16.0	50 ? 289-11
01	.3579	0.199			
02	.2072	-0.152			
03	.1870	-0.199			
04	.1595	-0.263			
05	.1503	-0.285			
06	.2274	-0.105			
07	.9219				
08	.9256				
09	.9219				
10	.9256				
11	.9182				
12	.9146				
13	.9072				
14	.8209				
15	.8190				
PTO	54.38		-070.0	16.0	51 ? 289-11
01	.3601	0.204			
02	.2111	-0.143			
03	.1890	-0.194			
04	.1578	-0.267			
05	.1523	-0.280			
06	.2350	-0.087			
07	.9228				
08	.9283				
09	.9283				
10	.9320				
11	.9228				
12	.9228				
13	.9117				
14	.8933				
15	.8694				
PTO	54.38		-080.0	16.0	52 ? 289-11
01	.3693	0.226			
02	.2129	-0.139			
03	.2019	-0.164			
04	.1688	-0.241			
05	.1523	-0.280			
06	.2369	-0.083			
07	.9301				
08	.9320				
09	.9283				
10	.9283				
11	.9264				
12	.9301				
13	.9264				
14	.9154				
15	.9044				

APPENDIX A-IV (CONT 3)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.38		-150.0	16.0	53	2	289-11
01	.3932	0.282					
02	.2277	-0.104					
03	.2313	-0.096					
04	.2497	-0.053					
05	.2516	-0.048					
06	.3178	0.106					
07	.9191						
08	.9136						
09	.8989						
10	.9081						
11	.8933						
12	.8933						
13	.8823						
14	.8731						
15	.6341						
PTO	54.38		-165.0	16.0	54	2	289-11
01	.4005	0.299					
02	.2424	-0.070					
03	.2460	-0.062					
04	.2681	-0.016					
05	.2828	0.024					
06	.3306	0.136					
07	.9172						
08	.9117						
09	.9025						
10	.9117						
11	.9025						
12	.9044						
13	.8915						
14	.8713						
15	.8529						
PTO	54.38		-180.0	16.0	55	2	289-11
01	.3840	0.260					
02	.2424	-0.070					
03	.2424	-0.070					
04	.2644	-0.019					
05	.2883	0.037					
06	.3306	0.136					
07	.9007						
08	.9117						
09	.9025						
10	.9117						
11	.9025						
12	.9081						
13	.9007						
14	.8860						
15	.8639						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic Run Test
PTO	54.43		000.0	20.0 56	? 289-11
01	.3505	0.182			
02	.2568	-0.036			
03	.2513	-0.049			
04	.1668	-0.246			
05	.1760	-0.225			
06	.2532	-0.045			
07	.8595				
08	.8586				
09	.9109				
10	.8970				
11	.8650				
12	.8650				
13	.8448				
14	.8227				
15	.8154				
PTO	54.48		015.0	20.0 57	? 289-11
01	.3300	0.134			
02	.2309	-0.097			
03	.2199	-0.122			
04	.1171	-0.362			
05	.1575	-0.268			
06	.2272	-0.105			
07	.8844				
08	.8880				
09	.8935				
10	.8715				
11	.8623				
12	.8807				
13	.8605				
14	.8366				
15	.8146				
PTO	54.48		030.0	20.0 58	? 289-11
01	.2970	0.057			
02	.1832	-0.208			
03	.1300	-0.332			
04	.0804	-0.448			
05	.1428	-0.302			
06	.2300	-0.097			
07	.9082				
08	.9064				
09	.9137				
10	.8954				
11	.8954				
12	.8917				
13	.8770				
14	.8605				
15	.8421				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.90

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic Run Test
PTO	54.48		045.0	20.0	59 7 289-11
01	.2835	0.019			
02	.1667	-0.246			
03	.1391	-0.311			
04	.1180	-0.358			
05	.1960	-0.178			
06	.2160	-0.122			
07	.9247				
08	.9174				
09	.9284				
10	.9137				
11	.9211				
12	.9174				
13	.9101				
14	.9046				
15	.9009				
PTO	54.48		060.0	20.0	60 7 289-11
01	.2896	0.040			
02	.1648	-0.251			
03	.1483	-0.289			
04	.1465	-0.293			
05	.2052	-0.157			
06	.2144	-0.135			
07	.9358				
08	.9266				
09	.9376				
10	.9229				
11	.9394				
12	.9284				
13	.9321				
14	.9358				
15	.9358				
PTO	54.48		075.0	20.0	61 7 289-11
01	.2896	0.040			
02	.1703	-0.238			
03	.1557	-0.272			
04	.1428	-0.302			
05	.1557	-0.272			
06	.2369	-0.079			
07	.9394				
08	.9302				
09	.9431				
10	.9339				
11	.9431				
12	.9376				
13	.9449				
14	.9468				
15	.9523				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.48		090.0	20.0	62	2	289-11
01	.2612	-0.026					
02	.1878	-0.197					
03	.1602	-0.262					
04	.1474	-0.291					
05	.1437	-0.300					
06	.2777	0.017					
07	.9422						
08	.9348						
09	.9440						
10	.9367						
11	.9477						
12	.9440						
13	.9514						
14	.7605						
15	.9569						
PTO	54.40		-015.0	20.0	1	3	289-11
01	.3319	0.138					
02	.2289	-0.101					
03	.1847	-0.204					
04	.0818	-0.444					
05	.1461	-0.294					
06	.2123	-0.140					
07	.8833						
08	.8998						
09	.8869						
10	.8649						
11	.9465						
12	.8575						
13	.8502						
14	.7603						
15	.9483						
PTO	54.50		-030.0	20.0	2	3	289-11
01	.3046	0.075					
02	.2000	-0.169					
03	.1330	-0.323					
04	.0771	-0.455					
05	.1486	-0.289					
06	.2230	-0.113					
07	.8734						
08	.8899						
09	.8752						
10	.8661						
11	.8257						
12	.8422						
13	.8404						
14	.8073						
15	.5394						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR ORL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.50		-035.0	20.0	3	3	289-11
01	.2991	0.062					
02	.1927	-0.186					
03	.1321	-0.327					
04	.0935	-0.417					
05	.1677	-0.246					
06	.2275	-0.104					
07	.8716						
08	.8809						
09	.8734						
10	.8606						
11	.8110						
12	.8257						
13	.8239						
14	.8045						
15	.5046						
PTO	54.40		-040.0	20.0	4	3	289-11
01	.2904	0.042					
02	.1783	-0.219					
03	.1342	-0.322					
04	.1268	-0.339					
05	.1931	-0.185					
06	.2132	-0.138					
07	.8750						
08	.8979						
09	.8732						
10	.8529						
11	.7849						
12	.7813						
13	.7261						
14	.6544						
15	.5404						
PTO	54.80		-015.0	20.0	1	5	289-11
01	.2245	-0.113					
02	.2354	-0.086					
03	.2080	-0.150					
04	.1040	-0.392					
05	.1551	-0.273					
06	.2190	-0.124					
07	.8850						
08	.9015						
09	.8887						
10	.8668						
11	.8467						
12	.8577						
13	.8449						
14	.7974						
15	.8412						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.90		-030.0	20.0	2	5	289-11
01	.1875	-0.198					
02	.2095	-0.147					
03	.1366	-0.317					
04	.0765	-0.457					
05	.1475	-0.291					
06	.2240	-0.113					
07	.8743						
08	.8925						
09	.8743						
10	.8670						
11	.8324						
12	.8488						
13	.8434						
14	.7778						
15	.6501						
PTO	54.80		-035.0	20.0	3	5	289-11
01	.1907	-0.214					
02	.2007	-0.167					
03	.1405	-0.307					
04	.0804	-0.427					
05	.1589	-0.265					
06	.2245	-0.117					
07	.8704						
08	.8897						
09	.8704						
10	.8595						
11	.8157						
12	.8339						
13	.8266						
14	.6423						
15	.4909						
PTO	54.60		-040.0	20.0	4	5	289-11
01	.1648	-0.251					
02	.1850	-0.204					
03	.1502	-0.285					
04	.1190	-0.358					
05	.1832	-0.209					
06	.2179	-0.127					
07	.8718						
08	.8983						
09	.8718						
10	.8535						
11	.7930						
12	.8022						
13	.7656						
14	.6319						
15	.5110						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.60		-045.0	20.0	5	5	289-11
01	.1593	-0.264					
02	.1813	-0.212					
03	.1538	-0.276					
04	.1410	-0.306					
05	.2033	-0.161					
06	.2125	-0.140					
07	.8773						
08	.8991						
09	.8736						
10	.8516						
11	.7747						
12	.7546						
13	.6868						
14	.6758						
15	.6117						
PTO	54.60		-050.0	20.0	6	5	289-11
01	.1557	-0.272					
02	.1795	-0.217					
03	.1593	-0.264					
04	.1648	-0.251					
05	.2070	-0.152					
06	.2070	-0.152					
07	.8828						
08	.8974						
09	.8773						
10	.8590						
11	.7747						
12	.6630						
13	.5879						
14	.7051						
15	.8352						
PTO	54.45		-055.0	20.0	7	5	289-11
01	.1543	-0.275					
02	.1763	-0.224					
03	.1616	-0.258					
04	.1781	-0.220					
05	.2020	-0.164					
06	.2057	-0.155					
07	.8907						
08	.9036						
09	.8834						
10	.8613						
11	.7548						
12	.6428						
13	.4096						
14	.5693						
15	.8430						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.45		-060.0	20.0	8	5	289-11
01	.1579	-0.267					
02	.1763	-0.224					
03	.1579	-0.267					
04	.1855	-0.203					
05	.1837	-0.207					
06	.2149	-0.134					
07	.8981						
08	.9091						
09	.8907						
10	.8724						
11	.7530						
12	.5326						
13	.3012						
14	.4720						
15	.8283						
PTO	54.40		-065.0	20.0	9	5	289-11
01	.1581	-0.266					
02	.1765	-0.224					
03	.1526	-0.279					
04	.1857	-0.202					
05	.1526	-0.279					
06	.2188	-0.125					
07	.9044						
08	.9154						
09	.9007						
10	.8915						
11	.9107						
12	.5607						
13	.3125						
14	.5129						
15	.8235						
PTO	54.30		-070.0	20.0	10	5	289-11
01	.1602	-0.262					
02	.1823	-0.210					
03	.1547	-0.274					
04	.1713	-0.236					
05	.1602	-0.262					
06	.2247	-0.111					
07	.9134						
08	.9245						
09	.9116						
10	.9079						
11	.8729						
12	.6722						
13	.4991						
14	.5967						
15	.8250						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.40		-075.0	20.0	11	5	289-11
01	.1654	-0.249					
02	.1801	-0.215					
03	.1581	-0.266					
04	.1526	-0.279					
05	.1489	-0.288					
06	.2224	-0.117					
07	.9191						
08	.9265						
09	.9210						
10	.9191						
11	.9026						
12	.8732						
13	.7537						
14	.7537						
15	.8254						
PTO	54.45		-080.0	20.0	12	5	289-11
01	.1690	-0.241					
02	.1781	-0.220					
03	.1616	-0.258					
04	.1459	-0.293					
05	.1377	-0.314					
06	.2167	-0.130					
07	.9201						
08	.9275						
09	.9256						
10	.9183						
11	.9128						
12	.8944						
13	.8430						
14	.7952						
15	.8283						
PTO	54.35		-090.0	20.0	13	5	289-11
01	.1472	-0.292					
02	.1895	-0.193					
03	.1766	-0.223					
04	.1527	-0.279					
05	.1298	-0.335					
06	.2006	-0.167					
07	.9255						
08	.9292						
09	.9255						
10	.9255						
11	.9200						
12	.9052						
13	.8548						
14	.8151						
15	.8372						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.35		-105.0	20.0	14	5	289-11
01	.1656	-0.249					
02	.1785	-0.219					
03	.1656	-0.249					
04	.1638	-0.253					
05	.1288	-0.335					
06	.1343	-0.322					
07	.9255						
08	.9255						
09	.9108						
10	.9181						
11	.8979						
12	.8372						
13	.6127						
14	.6845						
15	.8316						
PTO	54.35		-120.0	20.0	15	5	289-11
01	.1711	-0.236					
02	.2098	-0.146					
03	.1858	-0.202					
04	.1914	-0.189					
05	.1417	-0.305					
06	.1877	-0.197					
07	.9144						
08	.9108						
09	.8832						
10	.8850						
11	.7912						
12	.5833						
13	.3717						
14	.4765						
15	.8372						
PTO	54.35		-135.0	20.0	16	5	289-11
01	.1895	-0.193					
02	.2153	-0.133					
03	.2226	-0.116					
04	.2226	-0.116					
05	.1969	-0.176					
06	.2668	-0.013					
07	.8960						
08	.8850						
09	.8556						
10	.8592						
11	.8077						
12	.7912						
13	.7470						
14	.6569						
15	.5980						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic Run Test
PTO	54.30		-150.0	20.0	17 5 289-11
01	.7118	-0.141			
02	.7357	-0.086			
03	.7486	-0.055			
04	.7523	-0.047			
05	.7578	-0.034			
06	.8278	0.129			
07	.8969				
08	.8858				
09	.8600				
10	.8803				
11	.8582				
12	.8656				
13	.8532				
14	.8243				
15	.5341				
PTO	54.30		-165.0	20.0	18 5 289-11
01	.7376	-0.081			
02	.7431	-0.068			
03	.7634	-0.021			
04	.7762	0.009			
05	.8112	0.090			
06	.8333	0.142			
07	.9042				
08	.8895				
09	.8656				
10	.8766				
11	.8674				
12	.8729				
13	.8564				
14	.8343				
15	.8269				
PTO	54.30		-180.0	20.0	19 5 289-11
01	.7657	-0.017			
02	.7449	-0.064			
03	.7670	-0.013			
04	.7973	0.035			
05	.8297	0.134			
06	.8407	0.159			
07	.8895				
08	.8692				
09	.8527				
10	.9006				
11	.8877				
12	.8803				
13	.8564				
14	.8361				
15	.7974				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic Run Test
PTO	54.30		000.0	23.0 20	5 289-11
01	.2560	-0.038			
02	.2634	-0.021			
03	.1989	-0.171			
04	.1068	-0.396			
05	.1694	-0.240			
06	.2320	-0.094			
07	.8490				
08	.8556				
09	.8600				
10	.8600				
11	.8361				
12	.8416				
13	.8122				
14	.7422				
15	.7739				
PTO	54.30		015.0	23.0 21	5 289-11
01	.2357	-0.086			
02	.2026	-0.169			
03	.1123	-0.373			
04	.0691	-0.476			
05	.1565	-0.270			
06	.2118	-0.141			
07	.8840				
08	.8932				
09	.8969				
10	.8720				
11	.8619				
12	.8582				
13	.8250				
14	.7405				
15	.7532				
PTO	54.30		030.0	23.0 22	5 289-11
01	.2265	-0.107			
02	.1565	-0.270			
03	.1087	-0.382			
04	.0792	-0.450			
05	.1694	-0.240			
06	.2265	-0.107			
07	.9116				
08	.9116				
09	.9227				
10	.9024				
11	.9042				
12	.9006				
13	.8821				
14	.8343				
15	.8471				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.30		045.0	23.0	23	5	289-11
01	.7155	-0.133					
02	.1492	-0.287					
03	.1492	-0.287					
04	.1363	-0.317					
05	.1971	-0.175					
06	.2026	-0.163					
07	.9300						
08	.9727						
09	.9355						
10	.9208						
11	.9319						
12	.9263						
13	.9190						
14	.8932						
15	.9098						
PTO	54.25		060.0	23.0	24	5	289-11
01	.7286	-0.102					
02	.1595	-0.265					
03	.1512	-0.282					
04	.1382	-0.313					
05	.1604	-0.261					
06	.2065	-0.154					
07	.9419						
08	.9309						
09	.9456						
10	.9364						
11	.9493						
12	.9438						
13	.9419						
14	.9364						
15	.9512						
PTO	54.30		090.0	23.0	25	5	289-11
01	.7802	-0.098					
02	.1694	-0.240					
03	.1621	-0.257					
04	.1510	-0.283					
05	.1934	-0.184					
06	.2320	-0.094					
07	.9484						
08	.9411						
09	.9558						
10	.9484						
11	.9595						
12	.9521						
13	.9595						
14	.9669						
15	.9687						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.35		-015.0	23.0	26	5	289-11
01	.2079	-0.150					
02	.2153	-0.133					
03	.1086	-0.382					
04	.0644	-0.485					
05	.1546	-0.275					
06	.2098	-0.146					
07	.8629						
08	.8850						
09	.8703						
10	.8556						
11	.8169						
12	.8280						
13	.8040						
14	.7268						
15	.7746						
PTO	54.35		-030.0	23.0	27	5	289-11
01	.1656	-0.249					
02	.1877	-0.197					
03	.1030	-0.395					
04	.0828	-0.442					
05	.1564	-0.270					
06	.2171	-0.129					
07	.8408						
08	.8666						
09	.8408						
10	.8353						
11	.7930						
12	.8206						
13	.8224						
14	.7672						
15	.5225						
PTO	54.35		-035.0	23.0	28	5	289-11
01	.1527	-0.279					
02	.1822	-0.210					
03	.1159	-0.365					
04	.1086	-0.382					
05	.1711	-0.236					
06	.2079	-0.150					
07	.8335						
08	.8574						
09	.8316						
10	.8224						
11	.7746						
12	.8077						
13	.8151						
14	.7360						
15	.5281						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.30		-040.0	23.0	29	5	289-11
01	.1400	-0.309					
02	.1805	-0.214					
03	.1308	-0.330					
04	.1418	-0.304					
05	.1842	-0.206					
06	.1971	-0.175					
07	.8306						
08	.8508						
09	.8195						
10	.8048						
11	.7459						
12	.7845						
13	.7982						
14	.6556						
15	.5120						
PTO	54.20		-045.0	23.0	30	5	289-11
01	.1365	-0.317					
02	.1808	-0.213					
03	.1421	-0.304					
04	.1605	-0.261					
05	.1900	-0.192					
06	.1919	-0.188					
07	.8358						
08	.8542						
09	.8137						
10	.7860						
11	.7103						
12	.7509						
13	.7251						
14	.5941						
15	.4963						
PTO	54.35		-050.0	23.0	31	5	289-11
01	.1325	-0.326					
02	.1803	-0.215					
03	.1545	-0.275					
04	.1674	-0.245					
05	.1987	-0.172					
06	.1932	-0.185					
07	.8445						
08	.8629						
09	.8151						
10	.7599						
11	.6311						
12	.6440						
13	.6513						
14	.7341						
15	.6077						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic	Run	Test
PTO	54.30		-055.0	23.0	32	5	289-11
01	.1344	-0.322					
02	.1786	-0.219					
03	.1621	-0.257					
04	.1805	-0.214					
05	.1897	-0.193					
06	.2026	-0.163					
07	.8564						
08	.8729						
09	.8287						
10	.7680						
11	.5451						
12	.5543						
13	.5764						
14	.7551						
15	.8122						
PTO	54.30		-060.0	23.0	33	5	289-11
01	.1326	-0.326					
02	.1805	-0.214					
03	.1565	-0.270					
04	.1878	-0.197					
05	.1694	-0.240					
06	.2099	-0.146					
07	.8692						
08	.8877						
09	.8471						
10	.7901						
11	.5064						
12	.4254						
13	.3628						
14	.6077						
15	.8416						
PTO	54.30		-065.0	23.0	34	5	289-11
01	.1363	-0.317					
02	.1750	-0.227					
03	.1473	-0.292					
04	.1805	-0.214					
05	.1547	-0.274					
06	.2099	-0.146					
07	.8858						
08	.8987						
09	.8692						
10	.8048						
11	.5543						
12	.2707						
13	.3223						
14	.5396						
15	.8379						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{Px}{Pt,o}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic Run Test
PTO	54.20		-070.0	23.0 35	5 289-11
01	.1384	-0.312			
02	.1753	-0.226			
03	.1458	-0.298			
04	.1579	-0.244			
05	.1642	-0.252			
06	.2095	-0.149			
07	.8948				
08	.9006				
09	.8911				
10	.8450				
11	.5517				
12	.3229				
13	.3911				
14	.6107				
15	.8247				
PTO	54.30		-075.0	23.0 36	5 289-11
01	.1418	-0.304			
02	.1768	-0.223			
03	.1473	-0.292			
04	.1510	-0.283			
05	.1621	-0.257			
06	.1952	-0.180			
07	.9061				
08	.9190				
09	.9098				
10	.8895				
11	.6667				
12	.5267				
13	.4954				
14	.6777				
15	.8177				
PTO	54.20		-080.0	23.0 37	5 289-11
01	.1273	-0.338			
02	.1790	-0.218			
03	.1494	-0.287			
04	.1476	-0.291			
05	.1587	-0.265			
06	.2011	-0.166			
07	.9151				
08	.9207				
09	.9188				
10	.9096				
11	.8616				
12	.7620				
13	.6591				
14	.6605				
15	.8195				

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APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_1	Pic Run Test
PTO	54.25		-090.0	23.0 38	5 289-11
01	.1346	-0.324			
02	.1641	-0.252			
03	.1585	-0.265			
04	.1475	-0.291			
05	.1475	-0.291			
06	.2120	-0.141			
07	.9235				
08	.9272				
09	.9235				
10	.9180				
11	.8903				
12	.8350				
13	.7041				
14	.6691				
15	.8166				
PTO	54.20		-105.0	23.0 39	5 289-11
01	.1587	-0.269			
02	.1845	-0.205			
03	.1697	-0.239			
04	.1605	-0.261			
05	.1402	-0.308			
06	.1347	-0.321			
07	.9114				
08	.9133				
09	.8948				
10	.8838				
11	.6347				
12	.4705				
13	.4207				
14	.6808				
15	.8173				
PTO	54.15		-120.0	23.0 40	5 289-11
01	.1717	-0.235			
02	.2087	-0.148			
03	.1865	-0.200			
04	.1921	-0.187			
05	.1551	-0.273			
06	.1902	-0.192			
07	.8920				
08	.8846				
09	.8292				
10	.7996				
11	.5355				
12	.4783				
13	.4543				
14	.6445				
15	.8329				

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	54.20		-135.0	23.0	41	5	289-11
01	.1974	-0.175					
02	.2306	-0.097					
03	.2159	-0.132					
04	.2325	-0.093					
05	.2048	-0.158					
06	.2823	0.023					
07	.8653						
08	.8487						
09	.7860						
10	.7934						
11	.7362						
12	.7491						
13	.7546						
14	.6365						
15	.5166						
PTO	54.20		-150.0	23.0	42	5	289-11
01	.2214	-0.119					
02	.2399	-0.076					
03	.2528	-0.046					
04	.2675	-0.011					
05	.2841	0.027					
06	.3376	0.152					
07	.8782						
08	.8635						
09	.8266						
10	.8506						
11	.8247						
12	.8376						
13	.8321						
14	.7970						
15	.5203						
PTO	54.20		-165.0	23.0	43	5	289-11
01	.2435	-0.067					
02	.2491	-0.054					
03	.2694	-0.007					
04	.2989	0.062					
05	.3339	0.143					
06	.3358	0.148					
07	.8930						
08	.8782						
09	.8487						
10	.8653						
11	.8469						
12	.8432						
13	.8173						
14	.7878						
15	.4188						

APPENDIX A-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-11
AT MACH NUMBER 1.50

TAP	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta P}{q}$	ϕ	α_i	Pic Run Test
PTO	54.20		-180.0	23.0 44	5 289-11
01	.2731	0.002			
02	.2583	-0.033			
03	.2786	0.014			
04	.3063	0.079			
05	.3542	0.191			
06	.3413	0.161			
07	.8856				
08	.8616				
09	.8395				
10	.8542				
11	.8635				
12	.8524				
13	.8303				
14	.8044				
15	.4096				

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OAL 289-12

APPENDIX B-IV
TABULATED PRESSURE DATA FOR CAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_1	Pic Run Test
PTO	71.11		000.0	00.0	1 15 289-12
02	.1197	-0.023			
03	.1197	-0.023			
04	.1159	-0.030			
05	.1225	-0.015			
06	.1239	-0.011			
07	.6948				
08	.6977				
09	.7019				
10	.7033				
11	.7047				
12	.7047				
13	.7075				
14	.7075				
15	.7075				
PTO	71.51		060.0	00.0	2 15 289-12
02	.1176	-0.028			
03	.1162	-0.032			
04	.1148	-0.036			
05	.1218	-0.017			
06	.1232	-0.013			
07	.7035				
08	.7035				
09	.7049				
10	.7063				
11	.7077				
12	.7063				
13	.7077				
14	.7063				
15	.7063				
PTO	71.51		075.0	00.0	3 15 289-12
02	.1162	-0.032			
03	.1162	-0.032			
04	.1148	-0.036			
05	.1218	-0.017			
06	.1246	-0.009			
07	.7021				
08	.7021				
09	.7035				
10	.7035				
11	.7049				
12	.7035				
13	.7063				
14	.7049				
15	.7049				

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_1	Pic	Run	Test
PTO	71.66		090.0	00.0	4	15	289-12
02	.1160	-0.033					
03	.1160	-0.033					
04	.1160	-0.033					
05	.1229	-0.014					
06	.1243	-0.010					
07	.7035						
08	.7049						
09	.7049						
10	.7035						
11	.7063						
12	.7063						
13	.7076						
14	.7076						
15	.7076						
PTO	71.11		090.0	04.0	5	15	289-12
02	.1126	-0.042					
03	.1098	-0.050					
04	.1070	-0.058					
05	.1112	-0.046					
06	.1197	-0.023					
07	.7047						
08	.7019						
09	.7019						
10	.7033						
11	.7033						
12	.7033						
13	.6991						
14	.7033						
15	.7033						
PTO	71.26		075.0	04.0	6	15	289-12
02	.1138	-0.039					
03	.1110	-0.047					
04	.1068	-0.059					
05	.1110	-0.047					
06	.1194	-0.023					
07	.7018						
08	.7004						
09	.7004						
10	.7018						
11	.7032						
12	.7018						
13	.6990						
14	.7004						
15	.7018						

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	71.31		060.0	04.0	7	15	289-12
02	.1158	-0.033					
03	.1130	-0.041					
04	.1074	-0.057					
05	.1102	-0.049					
06	.1242	-0.010					
07	.6992						
08	.7020						
09	.7020						
10	.7020						
11	.7020						
12	.7020						
13	.6964						
14	.6992						
15	.6978						
PTO	71.31		060.0	08.0	8	15	289-12
02	.1074	-0.057					
03	.1032	-0.069					
04	.0962	-0.088					
05	.1046	-0.065					
06	.1214	-0.018					
07	.7090						
08	.7062						
09	.7048						
10	.7020						
11	.7006						
12	.6992						
13	.6992						
14	.6978						
15	.6936						
PTO	71.31		075.0	08.0	9	15	289-12
02	.1053	-0.063					
03	.0997	-0.078					
04	.0927	-0.098					
05	.0997	-0.078					
06	.1123	-0.043					
07	.7111						
08	.7069						
09	.7069						
10	.7055						
11	.7041						
12	.7027						
13	.7027						
14	.7041						
15	.7027						

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_1	Pic	Run	Test
PTO	71.31		090.0	08.0	10	15	289-12
02	.1011	-0.075					
03	.0955	-0.090					
04	.0913	-0.102					
05	.0941	-0.094					
06	.1053	-0.063					
07	.7125						
08	.7083						
09	.7083						
10	.7069						
11	.7055						
12	.7055						
13	.7055						
14	.7069						
15	.7069						
PTO	71.06		090.0	12.0	11	15	289-12
02	.0832	-0.125					
03	.0719	-0.156					
04	.0804	-0.132					
05	.0832	-0.125					
06	.1043	-0.066					
07	.7333						
08	.7277						
09	.7277						
10	.7249						
11	.7235						
12	.7207						
13	.7221						
14	.7249						
15	.7291						
PTO	71.31		075.0	12.0	12	15	289-12
02	.0885	-0.110					
03	.0913	-0.102					
04	.0759	-0.145					
05	.0857	-0.118					
06	.1123	-0.043					
07	.7322						
08	.7265						
09	.7265						
10	.7223						
11	.7209						
12	.7181						
13	.7195						
14	.7223						
15	.7223						

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	71.36		060.0	12.0	13	15	289-12
02	.0905	-0.104					
03	.0905	-0.104					
04	.0723	-0.155					
05	.0835	-0.124					
06	.1186	-0.026					
07	.7267						
08	.7197						
09	.7211						
10	.7155						
11	.7127						
12	.7099						
13	.7113						
14	.7099						
15	.7029						
PTO	71.31		060.0	16.0	14	15	289-12
02	.0801	-0.133					
03	.0773	-0.141					
04	.0632	-0.180					
05	.0787	-0.137					
06	.0997	-0.078					
07	.7504						
08	.7406						
09	.7476						
10	.7392						
11	.7420						
12	.7364						
13	.7350						
14	.7336						
15	.7237						
PTO	71.21		075.0	16.0	15	15	289-12
02	.0690	-0.164					
03	.0774	-0.141					
04	.0493	-0.219					
05	.0760	-0.145					
06	.0900	-0.106					
07	.7557						
08	.7458						
09	.7500						
10	.7458						
11	.7486						
12	.7458						
13	.7472						
14	.7486						
15	.7486						

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_1	Pic	Run	Test
PTO	71.21		090.0	16.0	16	15	289-12
02	.0760	-0.145					
03	.0690	-0.164					
04	.0395	-0.247					
05	.0802	-0.133					
06	.0802	-0.133					
07	.7571						
08	.7500						
09	.7528						
10	.7500						
11	.7514						
12	.7500						
13	.7514						
14	.7514						
15	.7585						
PTO	71.21		090.0	20.0	17	15	289-12
02	.0802	-0.133					
03	.0661	-0.172					
04	.0423	-0.239					
05	.0802	-0.133					
06	.0605	-0.188					
07	.7851						
08	.7767						
09	.7837						
10	.7809						
11	.7860						
12	.7908						
13	.7936						
14	.7964						
15	.7950						
PTO	71.21		075.0	20.0	18	15	289-12
02	.0704	-0.160					
03	.0605	-0.188					
04	.0465	-0.227					
05	.0802	-0.133					
06	.0774	-0.141					
07	.7823						
08	.7711						
09	.7823						
10	.7767						
11	.7851						
12	.7837						
13	.7880						
14	.7908						
15	.7823						

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR OAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{P_x}{P_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_i	Pic	Run	Test
PTO	71.16		060.0	20.0	19	15	289-12
02	.0662	-0.172					
03	.0676	-0.168					
04	.0507	-0.215					
05	.0676	-0.168					
06	.0831	-0.125					
07	.7787						
08	.7646						
09	.7773						
10	.7674						
11	.7759						
12	.7730						
13	.7716						
14	.7730						
15	.7520						
PTO	71.16		060.0	23.0	20	15	289-12
02	.0690	-0.164					
03	.0592	-0.192					
04	.0465	-0.227					
05	.0690	-0.164					
06	.0746	-0.149					
07	.7969						
08	.7929						
09	.8012						
10	.7913						
11	.8040						
12	.8026						
13	.7955						
14	.8054						
15	.7829						
PTO	71.11		075.0	23.0	21	15	289-12
02	.0761	-0.144					
03	.0579	-0.196					
04	.0409	-0.243					
05	.0991	-0.105					
06	.0719	-0.156					
07	.8073						
08	.7933						
09	.8087						
10	.8017						
11	.8144						
12	.8158						
13	.8158						
14	.8270						
15	.8186						

APPENDIX B-IV (CONT'D)
TABULATED PRESSURE DATA FOR CAL TEST 289-12
AT MACH NUMBER 2.00

Tap	$\frac{p_x}{p_{t,o}}$	$\frac{\Delta p}{q}$	ϕ	α_1	Pic	Run	Test
PTO	7[illegible].96		090.0	23.0	22	15	289-12
02	.0875	-0.113					
03	.0692	-0.164					
04	.0466	-0.227					
05	.0889	-0.109					
06	.0593	-0.191					
07	.8076						
08	.7978						
09	.8090						
10	.8062						
11	.8175						
12	.8203						
13	.8231						
14	.8302						
15	.8302						

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OAL 289-7

APPENDIX E
TABULATED PRESSURE DATA
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	a_i	Ø	DP	Pic	Run	Test
PTO	69.55			00.0	000	-12	1	27	289-07
1	08.35	.1201	-0.022						
2	08.35	.1201	-0.022						
4	08.35	.1201	-0.022						
5	08.25	.1186	-0.026						
6	08.55	.1229	-0.014						
7	48.55	.6981							
8	48.05	.6909							
9	48.45	.6966							
10	48.75	.7009							
11	48.85	.7024							
12	48.85	.7024							
13	48.95	.7038							
14	49.05	.7052							
15	49.05	.7052							
PTO	70.10			04.0	000	-12	2	27	289-07
1	08.45	.1205	-0.020						
2	08.45	.1205	-0.020						
4	08.45	.1205	-0.020						
5	08.45	.1205	-0.020						
6	09.85	.1405	0.035						
7	48.85	.6969							
8	48.35	.6897							
9	48.85	.6969							
10	49.05	.6997							
11	48.95	.6983							
12	48.95	.6983							
13	48.95	.6983							
14	48.85	.6969							
15	48.75	.6954							
PTO	70.15			08.0	000	-12	3	27	289-07
1	08.05	.1148	-0.036						
2	08.25	.1176	-0.029						
4	08.65	.1233	-0.013						
5	08.65	.1233	-0.013						
6	09.05	.1290	0.003						
7	48.25	.6878							
8	47.85	.6821							
9	48.25	.6878							
10	48.35	.6892							
11	48.25	.6878							
12	48.25	.6878							
13	47.65	.6793							
14	47.55	.6778							
15	46.95	.6693							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_L	ϕ	DP	Pic	Run	Test
PTO	70.35			12.0	000	-17	4	27	289-07
1	07.65	.1087	-0.053						
2	07.95	.1130	-0.041						
4	08.65	.1230	-0.013						
5	08.65	.1230	-0.013						
6	09.05	.1286	0.002						
7	47.05	.6816							
8	47.35	.6731							
9	47.35	.6731							
10	46.45	.6603							
11	45.45	.6461							
12	44.95	.6389							
13	45.05	.6546							
14	46.95	.6674							
15	46.25	.6574							
PTO	70.65			16.0	000	-17	5	27	289-07
1	06.95	.0954	-0.082						
2	07.75	.1097	-0.051						
4	07.75	.1097	-0.051						
5	06.45	.0913	-0.103						
6	07.15	.1013	-0.074						
7	47.75	.6759							
8	47.25	.6688							
9	47.25	.6688							
10	45.95	.6504							
11	44.45	.6292							
12	43.85	.6207							
13	43.05	.6093							
14	43.15	.6107							
15	42.15	.5966							
PTO	69.65			20.0	000	-17	6	27	289-07
1	06.60	.0948	-0.092						
2	07.90	.1134	-0.040						
4	02.70	.0388	-0.249						
5	03.80	.0546	-0.206						
6	05.60	.0804	-0.132						
7	47.70	.6849							
8	47.40	.6806							
9	47.40	.6806							
10	45.90	.6590							
11	43.70	.6275							
12	43.40	.6231							
13	41.20	.5915							
14	38.00	.5456							
15	33.40	.4797							

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APPENDIX E (CONT'D)
TABLE II CAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_j	ϕ	DP	Pic	Run	Test
PTO	60.40			23.0	[illegible]	-17	7	27	289-07
1	06.20	.0980	-0.033						
2	08.30	.1196	-0.023						
4	01.50	.0231	-0.033						
5	03.60	.0519	-0.013						
6	05.10	.0735	-0.152						
7	48.60	.7003							
8	49.10	.6931							
9	47.20	.6589							
10	46.40	.6396							
11	44.10	.5954							
12	43.50	.5767							
13	41.60	.5994							
14	38.20	.5504							
15	33.50	.4827							
PTO	70.05			00.0	015	-18	9	27	289-07
1	08.40	.1193	-0.027						
2	08.30	.1185	-0.026						
4	08.30	.1185	-0.026						
5	08.20	.1171	-0.030						
6	08.40	.1196	-0.022						
7	49.40	.6909							
8	48.70	.6852							
9	49.00	.6905							
10	49.20	.7024							
11	49.40	.7082							
12	49.40	.7052							
13	49.40	.7052							
14	49.40	.7052							
15	49.50	.7066							
PTO	69.35			04.5	015	-18	9	27	289-07
1	08.40	.1211	-0.019						
2	08.30	.1197	-0.023						
4	08.30	.1197	-0.023						
5	08.30	.1193	-0.027						
6	08.60	.1204	-0.030						
7	47.70	.6878							
8	48.10	.6936							
9	48.40	.6979							
10	48.50	.6994							
11	48.50	.6994							
12	48.40	.6979							
13	47.20	.6806							
14	45.40	.6570							
15	48.30	.6965							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_j	ϕ	DP	Ptc	Run	Test
PTO	69.65			08.0	015	-18	11	27	289-07
1	08.10	.1163	-0.032						
2	08.00	.1149	-0.036						
4	08.30	.1192	-0.024						
5	08.20	.1177	-0.028						
6	08.20	.1221	-0.012						
7	47.50	.6820							
8	47.30	.6863							
9	48.00	.6892							
10	47.90	.6877							
11	47.60	.6834							
12	47.60	.6834							
13	47.00	.6749							
14	47.10	.6763							
15	46.50	.6676							
PTO	69.65			12.0	015	-18	11	27	289-07
1	07.40	.1062	-0.060						
2	07.50	.1077	-0.056						
4	07.90	.1134	-0.040						
5	08.00	.1149	-0.036						
6	08.60	.1235	-0.012						
7	47.40	.6805							
8	47.60	.6834							
9	47.70	.6849							
10	47.10	.6763							
11	45.30	.6643							
12	45.90	.6590							
13	44.60	.6403							
14	43.70	.6289							
15	41.50	.5958							
PTO	70.00			16.0	016	-18	11	27	289-07
1	06.30	.0971	-0.085						
2	07.00	.1000	-0.078						
4	05.70	.0814	-0.130						
5	04.30	.0586	-0.185						
6	06.20	.0886	-0.110						
7	48.60	.6943							
8	48.70	.6957							
9	48.80	.6971							
10	47.80	.6829							
11	46.80	.6686							
12	46.30	.6614							
13	45.20	.6457							
14	43.40	.6200							
15	40.60	.5800							

APPENDIX E (CONT'D)

TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	DP	Pic	Run	Test
PTO	69.80			20.0	015	-18	13	27	289-07
1	06.20	.0888	-0.109						
2	06.40	.0917	-0.101						
4	01.80	.0258	-0.335						
5	03.90	.0544	-0.205						
6	05.60	.0802	-0.133						
7	50.00	.7160							
8	49.90	.7149							
9	50.20	.7192							
10	49.00	.7020							
11	47.70	.6833							
12	47.60	.6819							
13	46.10	.6605							
14	43.70	.6261							
15	40.50	.5802							
PTO	69.85			23.0	015	-1	14	27	289-07
1	06.00	.0859	-0.117						
2	05.60	.0802	-0.133						
4	01.40	.0200	-0.301						
5	03.50	.0501	-0.217						
6	05.00	.0716	-0.157						
7	51.20	.7330							
8	51.20	.7330							
9	51.60	.7387							
10	50.30	.7201							
11	49.10	.7029							
12	49.00	.7015							
13	47.40	.6786							
14	45.00	.6442							
15	41.20	.5898							
PTO	69.85			00.0	020	-18	15	27	289-07
1	08.50	.1217	-0.017						
2	08.40	.1203	-0.021						
4	08.30	.1188	-0.025						
5	08.10	.1160	-0.033						
6	08.40	.1203	-0.021						
7	49.00	.7001							
8	49.20	.7044							
9	49.20	.7044							
10	49.30	.7058							
11	49.40	.7072							
12	49.30	.7058							
13	49.30	.7058							
14	49.40	.7072							
15	49.40	.7072							

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APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	DP	Pic	Run	Test
PTO	69.85			04.0	.30	-18	16	27	289-7
1	00.50	.1217	-0.017						
2	09.30	.1185	-0.025						
4	08.20	.1174	-0.029						
5	08.10	.1160	-0.032						
6	09.60	.1374	0.027						
7	48.90	.7001							
8	49.10	.7029							
9	49.10	.7029							
10	49.20	.7044							
11	49.10	.7029							
12	49.00	.7015							
13	48.10	.6926							
14	49.80	.6986							
15	48.60	.6958							
PTO	69.75			08.0	.30	-18	17	27	289-7
1	00.10	.1161	-0.033						
2	07.80	.1116	-0.045						
4	07.70	.1104	-0.049						
5	07.10	.1018	-0.075						
6	08.90	.1276	-0.001						
7	48.70	.6982							
8	48.70	.6982							
9	48.70	.6982							
10	48.40	.6939							
11	48.20	.6910							
12	48.00	.6882							
13	47.60	.6824							
14	47.30	.6781							
15	46.70	.6695							
PTO	69.75			12.0	.30	-18	18	27	289-7
1	07.40	.1061	-0.061						
2	07.20	.1032	-0.069						
4	06.30	.0903	-0.105						
5	04.70	.0674	-0.169						
6	05.00	.0717	-0.157						
7	49.30	.7069							
8	49.20	.7054							
9	49.00	.7025							
10	48.40	.6939							
11	48.00	.6882							
12	47.70	.6839							
13	47.00	.6738							
14	46.40	.6652							
15	45.10	.6466							

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APPENDIX B (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_j	ϕ	DP	Pic	Run	Test
PTO	70.05			16.0	030	-18	21	27	289-07
1	06.50	.0922	-0.098						
2	06.00	.0857	-0.118						
4	01.80	.0257	-0.285						
5	03.10	.0443	-0.233						
6	06.40	.0914	-0.102						
7	50.50	.7209							
8	50.50	.7209							
9	50.50	.7223							
10	49.80	.7109							
11	49.20	.7038							
12	48.90	.6981							
13	47.40	.6767							
14	47.10	.6724							
15	45.50	.6510							
PTO	69.05			20.0	030	-18	21	27	289-07
1	05.90	.0845	-0.121						
2	04.90	.0702	-0.161						
4	01.70	.0243	-0.289						
5	04.20	.0601	-0.189						
6	06.00	.0859	-0.117						
7	52.10	.7459							
8	52.00	.7445							
9	52.40	.7502							
10	51.60	.7387							
11	51.20	.7330							
12	50.90	.7287							
13	50.00	.7158							
14	43.50	.6058							
15	46.20	.6614							
PTO	69.75			23.0	030	-18	21	27	289-07
1	05.20	.0746	-0.140						
2	04.40	.0631	-0.181						
4	01.60	.0229	-0.293						
5	03.50	.0502	-0.217						
6	05.50	.0788	-0.137						
7	53.30	.7642							
8	53.40	.7656							
9	53.90	.7728							
10	52.80	.7584							
11	52.70	.7556							
12	52.60	.7541							
13	51.70	.7412							
14	50.30	.7211							
15	47.90	.6869							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	MP	Pic	Run	Test
PTO	69.75			00.0	045	-12	23	27	289-07
1	00.50	.1219	-0.016						
2	08.30	.1190	-0.025						
4	08.20	.1176	-0.029						
5	08.10	.1161	-0.033						
6	08.40	.1204	-0.021						
7	49.00	.7060							
8	49.10	.7063							
9	49.20	.7064							
10	49.20	.7064							
11	49.30	.7066							
12	49.30	.7063							
13	49.40	.7062							
14	49.40	.7062							
15	49.40	.7062							
PTO	69.65			04.0	045	-12	23	27	289-07
1	08.50	.1220	-0.016						
2	08.30	.1192	-0.024						
4	08.10	.1163	-0.032						
5	08.00	.1149	-0.036						
6	08.20	.1221	-0.017						
7	48.90	.7021							
8	48.90	.7021							
9	48.90	.7021							
10	48.90	.7021							
11	48.90	.7021							
12	48.90	.7006							
13	48.70	.6980							
14	48.60	.6970							
15	48.50	.6963							
PTO	69.40			03.0	045	-12	24	27	289-07
1	08.00	.1153	-0.035						
2	07.60	.1095	-0.051						
4	07.20	.1037	-0.067						
5	06.80	.0980	-0.083						
6	08.40	.1210	-0.019						
7	48.10	.7075							
8	48.00	.7061							
9	48.90	.7032							
10	48.60	.7002							
11	48.60	.7003							
12	48.40	.6974							
13	48.20	.6945							
14	47.80	.6888							
15	47.40	.6830							

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APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	DP	Pic	Run	Test
PTO	69.50			12.0	045	-18	25	27	289-07
1	07.30	.1050	-0.064						
2	06.50	.0935	-0.096						
4	05.10	.0734	-0.152						
5	04.70	.0681	-0.134						
6	06.30	.0906	-0.104						
7	50.30	.7237							
8	50.00	.7194							
9	49.90	.7180							
10	49.40	.7108							
11	49.20	.7079							
12	48.90	.7036							
13	48.60	.6993							
14	48.20	.6935							
15	47.60	.6849							
PTO	69.65			16.0	045	-18	26	27	289-07
1	06.35	.0912	-0.102						
2	05.45	.0782	-0.139						
4	04.05	.0581	-0.195						
5	05.35	.0768	-0.143						
6	06.95	.0998	-0.078						
7	51.85	.7444							
8	51.35	.7373							
9	51.55	.7401							
10	50.85	.7301							
11	50.95	.7301							
12	50.55	.7258							
13	49.65	.7128							
14	49.55	.7114							
15	48.95	.7028							
PTO	69.65			20.0	045	-18	27	27	289-07
1	05.75	.0826	-0.126						
2	04.95	.0711	-0.158						
4	04.45	.0639	-0.179						
5	05.25	.0754	-0.145						
6	05.45	.0826	-0.099						
7	53.45	.7674							
8	53.05	.7617							
9	53.35	.7588							
10	52.85	.7588							
11	53.15	.7631							
12	52.95	.7602							
13	52.55	.7545							
14	51.95	.7459							
15	50.55	.7258							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	DP	Pic	Run	Test
PTO	69.40			23.0	045	-18	29	27	289-07
1	05.15	.0742	-0.150						
2	05.15	.0742	-0.150						
4	04.25	.0612	-0.186						
5	04.85	.0713	-0.159						
6	05.75	.0829	-0.125						
7	54.75	.7890							
8	54.45	.7846							
9	55.15	.7947							
10	54.45	.7846							
11	54.75	.7889							
12	54.75	.7889							
13	54.35	.7831							
14	53.85	.7759							
15	52.55	.7572							
PTO	69.55			00.0	-015	-18	29	27	289-07
1	09.60	.1237	-0.011						
2	08.40	.1208	-0.020						
4	08.40	.1208	-0.020						
5	08.30	.1193	-0.024						
6	09.60	.1237	-0.011						
7	48.50	.6973							
8	48.50	.6973							
9	49.90	.7017							
10	49.00	.7045							
11	49.10	.7060							
12	49.10	.7060							
13	49.00	.7045							
14	49.10	.7060							
15	49.20	.7074							
PTO	69.80			04.0	-015	-18	30	27	289-07
1	08.60	.1237	-0.013						
2	08.50	.1218	-0.017						
4	08.50	.1218	-0.017						
5	08.50	.1218	-0.017						
6	09.90	.1418	0.039						
7	49.10	.7034							
8	49.00	.7020							
9	49.40	.7077							
10	49.20	.7048							
11	49.20	.7048							
12	49.10	.7034							
13	49.10	.7034							
14	49.00	.7020							
15	48.70	.6977							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	DP	Pic	Run	Test
PTO	69.95			08.0	-.15	-18	31	27	289-07
1	08.30	.1187	-0.025						
2	03.30	.1187	-0.025						
4	08.50	.1215	-0.019						
5	08.20	.1172	-0.030						
6	09.60	.1372	0.026						
7	48.30	.6976							
8	46.70	.6062							
9	49.20	.7036							
10	49.10	.7019							
11	49.00	.7005							
12	48.90	.6991							
13	48.70	.6962							
14	48.20	.6891							
15	47.80	.6833							
PTO	69.90			12.0	-.15	-18	32	27	289-07
1	07.80	.1116	-0.045						
2	08.00	.1144	-0.037						
4	08.20	.1173	-0.029						
5	07.80	.1116	-0.045						
6	08.70	.1245	-0.009						
7	47.40	.6781							
8	45.90	.6710							
9	46.30	.6910							
10	48.50	.6939							
11	47.70	.6824							
12	47.90	.6853							
13	47.60	.6810							
14	46.60	.6667							
15	45.00	.6552							
PTO	69.90			16.0	-.15	-18	33	27	289-07
1	07.20	.1030	-0.069						
2	07.60	.1087	-0.053						
4	05.30	.0758	-0.145						
5	04.20	.0601	-0.188						
6	06.20	.0887	-0.109						
7	46.10	.6595							
8	45.70	.6538							
9	45.40	.6495							
10	43.80	.6266							
11	45.20	.6466							
12	45.50	.6509							
13	44.10	.6309							
14	41.70	.5966							
15	41.00	.5866							

APPENDIX B (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	DP	Pic	Run	Test
PTO	69.90			20.0	-015	-18	34	27	289- 7
1	06.60	.0944	-0.003						
2	07.00	.1001	-0.077						
4	01.50	.0215	-0.297						
5	03.70	.0529	-0.208						
6	05.60	.0801	-0.133						
7	44.90	.6423							
8	44.80	.6409							
9	44.10	.6309							
10	42.40	.6066							
11	39.20	.5607							
12	41.30	.5909							
13	40.40	.5780							
14	38.60	.5522							
15	38.00	.5436							
PTO	69.80			22.0	-015	-18	35	27	289-07
1	06.20	.0883	-0.109						
2	06.80	.0974	-0.085						
4	01.40	.0201	-0.301						
5	03.20	.0458	-0.229						
6	05.10	.0731	-0.153						
7	45.10	.6461							
8	45.00	.6447							
9	43.80	.6275							
10	42.20	.6046							
11	38.60	.5530							
12	38.50	.5516							
13	36.60	.5244							
14	37.20	.5330							
15	35.80	.5129							
PTO	69.80			20.0	- 30	-18	36	27	289-07
1	08.60	.1232	-0.013						
2	08.40	.1203	-0.021						
4	08.40	.1203	-0.021						
5	08.30	.1189	-0.025						
6	08.60	.1232	-0.013						
7	49.10	.7034							
8	49.40	.7077							
9	49.50	.7092							
10	49.60	.7106							
11	49.50	.7092							
12	49.30	.7063							
13	49.20	.7049							
14	49.30	.7063							
15	49.30	.7063							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	DP	Pic	Run	Test
PTO	69.80			04.0	-030	-13	37	27	289-7
1	08.50	.1219	-0.017						
2	08.50	.1218	-0.017						
4	08.40	.1200	-0.021						
5	07.30	.1180	-0.038						
6	09.60	.1375	0.027						
7	49.30	.7092							
8	49.60	.7136							
9	49.80	.7138							
10	49.70	.7120							
11	49.60	.7106							
12	49.60	.7105							
13	49.50	.7092							
14	49.70	.7040							
15	43.00	.7020							
PTO	69.80			08.0	-030	-13	37	27	289-7
1	08.10	.1160	-0.033						
2	08.20	.1175	-0.029						
4	07.90	.1132	-0.041						
5	07.20	.1032	-0.069						
6	09.60	.1380	0.033						
7	49.10	.7034							
8	49.60	.7106							
9	49.80	.7140							
10	49.70	.7120							
11	49.30	.7063							
12	49.30	.7063							
13	49.30	.7063							
14	48.80	.6991							
15	49.40	.7034							
PTO	69.80			12.0	-030	-13	37	27	289-7
1	07.40	.1060	-0.061						
2	07.70	.1103	-0.049						
4	06.30	.0903	-0.105						
5	04.70	.0673	-0.159						
6	04.30	.0702	-0.161						
7	49.40	.7034							
8	49.10	.7034							
9	49.30	.7063							
10	49.20	.7048							
11	48.30	.6920							
12	48.30	.6920							
13	47.30	.6777							
14	45.90	.6563							
15	33.00	.4057							

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APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_f	ϕ	DP	Pic	Run	Test
PTO	60.80			15.0	-.30	-13	42	27	289-7
1	06.50	.0931	-0.207						
2	07.00	.1003	-0.077						
4	02.00	.0287	-0.277						
5	03.20	.0458	-0.239						
6	06.50	.0931	-0.207						
7	47.60	.6819							
8	43.50	.6943							
9	48.20	.6903							
10	47.20	.6762							
11	44.30	.6433							
12	45.80	.6562							
13	44.30	.6433							
14	44.20	.6347							
15	21.20	.3037							
PTO	60.85			30.0	-.00	-14	41	27	289-7
1	05.50	.0802	-0.122						
2	06.60	.0945	-0.093						
4	01.90	.0272	-0.281						
5	04.10	.0587	-0.193						
6	06.00	.0850	-0.117						
7	42.10	.6027							
8	44.70	.6399							
9	44.00	.6299							
10	42.60	.6099							
11	40.00	.5855							
12	42.00	.6142							
13	42.10	.6027							
14	37.70	.5397							
15	22.30	.3193							
PTO	60.75			23.0	-.03	-13	42	27	289-7
1	04.05	.0710	-0.150						
2	06.55	.0939	-0.095						
4	01.75	.0251	-0.287						
5	03.45	.0495	-0.210						
6	05.35	.0767	-0.143						
7	39.55	.5713							
8	40.45	.5796							
9	41.55	.5957							
10	40.35	.5785							
11	35.05	.5168							
12	37.55	.5386							
13	36.25	.5197							
14	34.25	.4910							
15	22.75	.3262							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	$\alpha_{\dot{A}}$	ϕ	DP	Pic	Run	Test
PTO	59.80			00.0	-045	-1[illegible]	43	27	[illegible]-07
1	08.55	.1225	-0.015						
2	08.25	.1182	-0.027						
4	08.15	.1168	-0.031						
5	08.15	.1168	-0.031						
6	08.55	.1225	-0.015						
7	49.75	.7120							
8	49.75	.7128							
9	49.65	.7113							
10	49.75	.7122							
11	49.65	.7113							
12	49.55	.7099							
13	49.45	.7085							
14	49.35	.7070							
15	49.25	.7056							
PTO	69.80			04.[illegible]	-045	-1[illegible]	44	27	289-07
1	08.50	.1218	-0.017						
2	08.60	.1232	-0.013						
4	08.30	.1189	-0.025						
5	08.20	.1175	-0.029						
6	09.40	.1347	0.019						
7	50.00	.7163							
8	50.00	.7163							
9	50.10	.7173							
10	50.20	.7192							
11	49.90	.7149							
12	49.80	.7135							
13	49.80	.7135							
14	49.60	.7106							
15	49.60	.7106							
PTO	69.80			08.0	-045	-1[illegible]	[illegible]	27	[illegible]-07
1	08.00	.1146	-0.037						
2	08.10	.1160	-0.033						
4	07.50	.1074	-0.057						
5	07.00	.1003	-0.077						
6	08.40	.1203	-0.021						
7	49.90	.7149							
8	50.00	.7163							
9	50.00	.7163							
10	50.10	.7173							
11	49.90	.7149							
12	49.60	.7106							
13	49.70	.7120							
14	49.10	.7034							
15	48.40	.6934							

APPENDIX E (CONT'D)

TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	DP	Pic	Run	Test
PTO	69.80			12.0	-.45	-18	46	27	289-07
1	07.20	.1032	-0.069						
2	07.30	.1046	-0.065						
4	03.30	.0759	-0.145						
5	04.00	.0762	-0.151						
6	06.20	.0888	-0.103						
7	49.40	.7077							
8	49.80	.7135							
9	49.60	.7106							
10	49.30	.7063							
11	49.40	.6934							
12	48.30	.6920							
13	47.00	.6734							
14	43.90	.6275							
15	23.00	.3295							
PTO	69.75			16.0	-.45	-18	47	27	289-07
1	06.25	.0836	-0.127						
2	06.65	.0953	-0.091						
4	04.45	.0638	-0.179						
5	05.35	.0767	-0.143						
6	06.95	.0996	-0.079						
7	49.35	.6932							
8	48.75	.6850							
9	47.75	.6946							
10	46.85	.6717							
11	43.85	.6287							
12	42.75	.6129							
13	36.55	.5240							
14	34.05	.4882							
15	26.15	.3749							
PTO	69.75			20.0	-.45	-18	49	27	289-07
1	05.60	.0803	-0.133						
2	06.80	.0975	-0.085						
4	05.10	.0731	-0.153						
5	05.10	.0731	-0.153						
6	06.50	.0932	-0.097						
7	45.50	.6523							
8	46.20	.6624							
9	44.30	.6351							
10	42.20	.6050							
11	37.60	.5391							
12	38.80	.5563							
13	37.40	.5362							
14	33.40	.4789							
15	22.10	.3169							

APPENDIX E (CONT'D)
TABLE II OAL TEST 289-7 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_{β}	ø	DP	Pic	Run	Test
PTO	69.75			23.0	-.145	-16	43	27	289-7
1	05.10	.0731	-0.153						
2	07.50	.1075	-0.157						
4	05.20	.0746	-0.149						
5	04.60	.0659	-0.173						
6	05.90	.0846	-0.121						
7	41.90	.5993							
8	43.00	.6165							
9	40.40	.5792							
10	37.40	.5362							
11	32.80	.4703							
12	34.90	.5004							
13	34.60	.4961							
14	27.30	.3914							
15	23.80	.3412							
PTO	69.75			23.0	-.145	-16	50	27	289-7
1	05.10	.0731	-0.153						
2	07.50	.1075	-0.157						
4	05.20	.0746	-0.149						
5	04.60	.0659	-0.173						
6	05.90	.0846	-0.121						
7	41.90	.5993							
8	43.00	.6165							
9	40.40	.5792							
10	37.40	.5362							
11	32.80	.4703							
12	34.90	.5004							
13	34.60	.4961							
14	27.30	.3914							
15	23.80	.3412							

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OAL 289-8

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APPENDIX E
TABULATED PRESSURE DATA
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
PTO	69.63			00.0 - 6[illegible].0		1	35	289-08
1	08.43	.1211	-0.010					
2	8.23	.5490	1.177					
4	08.23	.1182	-0.037					
5	08.33	.1196	-0.[illegible]23					
6	08.73	.1254	-0.017					
7	49.43	.7206						
8	49.53	.7113						
9	49.63	.7124						
10	49.73	.7143						
11	49.83	.7156						
12	49.73	.7143						
13	49.73	.7143						
14	49.63	.7129						
15	49.23	.7070						
PTO	69.33			-04.0 -36[illegible].0		2	35	289-08
1	08.03	.1159	-0.034					
2	07.73	.1115	-0.046					
4	07.63	.1101	-0.049					
5	07.53	.1086	-0.054					
6	08.23	.1187	-0.025					
7	49.23	.7101						
8	49.43	.7130						
9	49.33	.7115						
10	49.13	.7086						
11	49.13	.7086						
12	49.03	.7072						
13	48.33	.6971						
14	48.53	.7000						
15	48.03	.7043						
PTO	69.23			00.0 -04[illegible].1		3	35	289-08
1	08.13	.1174	-0.020					
2	08.23	.1188	-0.036					
4	07.83	.1131	-0.041					
5	07.63	.1102	-0.049					
6	08.23	.1203	-0.021					
7	49.43	.7140						
8	49.43	.7140						
9	49.53	.7156						
10	49.63	.7160						
11	49.53	.7156						
12	49.63	.7160						
13	49.73	.7193						
14	49.63	.7160						
15	49.23	.7059						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
PTO	69.53			04.0	-060.0	4	35	289-08
~~1~~	~~7.53~~	~~.5298~~	~~-1.151~~					
2	07.63	.1097	-0.051					
4	06.93	.0997	-0.079					
5	06.63	.0954	-0.091					
6	08.03	.1155	-0.034					
7	49.63	.7132						
8	49.83	.7167						
9	49.93	.7181						
10	50.03	.7195						
11	49.83	.7167						
12	49.93	.7181						
13	50.13	.7210						
14	50.03	.7195						
15	41.03	.5901						
PTO	69.53			04.0	-060.0	5	35	289-08
1	07.53	.1083	-0.054					
2	07.63	.1097	-0.051					
4	06.93	.0997	-0.079					
5	06.63	.0954	-0.091					
6	08.03	.1155	-0.034					
7	49.63	.7132						
8	49.83	.7167						
9	49.93	.7181						
10	50.03	.7195						
11	49.83	.7167						
12	49.93	.7181						
13	50.13	.7210						
14	50.03	.7195						
15	41.03	.5901						
PTO	69.73			12.0	-060.0	6	35	289-08
1	06.83	.0979	-0.084					
2	06.93	.0994	-0.079					
4	05.83	.0835	-0.124					
5	05.83	.0835	-0.124					
6	08.13	.1166	-0.031					
7	49.53	.7103						
8	49.83	.7146						
9	49.83	.7146						
10	50.03	.7175						
11	49.53	.7103						
12	49.43	.7089						
13	49.73	.7132						
14	49.13	.7046						
15	47.73	.6845						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
PTO	60.68			16.0	-060.0	7	35	289-08
1	06.78	.0978	-0.035					
2	05.20	.0758	-0.145					
4	04.88	.0700	-0.162					
5	04.88	.0700	-0.162					
6	05.22	.0801	-0.105					
7	48.08	.7008						
8	48.38	.7007						
9	48.08	.7044						
10	48.88	.7015						
11	47.70	.6857						
12	47.68	.6843						
13	45.38	.6513						
14	40.18	.5766						
15	40.38	.5795						
PTO	60.53			20.0	-060.0	8	35	289-09
1	07.08	.1018	-0.073					
2	05.18	.0744	-0.149					
4	04.98	.0715	-0.157					
5	05.08	.0730	-0.153					
6	05.38	.0773	-0.141					
7	47.08	.6761						
8	48.38	.6910						
9	47.48	.6824						
10	46.68	.6705						
11	42.08	.6048						
12	25.60	.3681						
13	18.48	.2656						
14	20.78	.2986						
15	37.18	.5343						
PTO	60.63			22.0	-075.0	9	35	289-09
1	07.48	.1057	-0.060					
2	05.78	.0823	-0.127					
4	05.08	.0729	-0.155					
5	05.58	.0794	-0.135					
6	05.08	.0729	-0.155					
7	47.08	.6764						
8	47.28	.6789						
9	45.08	.6482						
10	40.18	.5763						
11	20.78	.2977						
12	16.58	.2374						
13	14.08	.2144						
14	17.08	.2445						
15	33.78	.4844						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_f	ϕ	Pic Run Test
PTO	60.73			-04.0	-075.0	11 35 289-08
1	08.13	.1166	-0.031			
2	07.83	.1123	-0.043			
4	07.63	.1094	-0.051			
5	07.63	.1094	-0.051			
6	08.33	.1195	-0.023			
7	49.53	.7104				
8	49.73	.7132				
9	49.63	.7117				
10	49.43	.7089				
11	49.43	.7089				
12	49.33	.7074				
13	48.53	.6960				
14	48.83	.7003				
15	49.03	.7031				
PTO	60.58			-04.0	-060.0	11 35 289-08
1	08.23	.1181	-0.027			
2	07.83	.1124	-0.043			
4	07.73	.1109	-0.047			
5	07.73	.1109	-0.047			
6	08.43	.1210	-0.019			
7	49.63	.7122				
8	49.83	.7151				
9	49.53	.7108				
10	49.33	.7080				
11	49.23	.7065				
12	49.13	.7051				
13	48.03	.6893				
14	48.73	.6993				
15	49.03	.7022				
PTO	60.73			00.0	-060.0	11 35 289-08
1	08.33	.1195	-0.023			
2	08.23	.1180	-0.027			
4	08.13	.1166	-0.031			
5	08.23	.1180	-0.027			
6	08.63	.1238	-0.011			
7	49.63	.7117				
8	49.73	.7132				
9	49.83	.7146				
10	49.83	.7146				
11	49.83	.7146				
12	49.73	.7132				
13	49.73	.7132				
14	49.53	.7103				
15	49.93	.7017				

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APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	β	Pic	Run	Test
PTO	60.73			04.0 - 60.0		13	35	289-8
1	08.33	.1105	-0.023					
2	08.33	.1105	-0.023					
4	07.93	.1137	-0.030					
5	07.93	.1139	-0.042					
6	08.73	.1152	-0.007					
7	49.73	.7132						
8	49.93	.7160						
9	50.03	.7174						
10	50.03	.7171						
11	50.03	.7172						
12	50.03	.7176						
13	49.73	.7133						
14	49.33	.7145						
15	49.53	.7169						
PTO	60.73			08.0 - 60.0		14	35	289-8
1	07.73	.1123	-0.043					
2	08.03	.1152	-0.035					
4	07.43	.1066	-0.060					
5	07.03	.1008	-0.078					
6	08.73	.1152	-0.007					
7	49.93	.7140						
8	49.93	.7160						
9	50.03	.7175						
10	50.03	.7176						
11	49.93	.7145						
12	50.03	.7178						
13	49.93	.7149						
14	49.53	.7109						
15	32.63	.4679						
PTO	60.68			12.0 - 60.0		15	35	289-8
1	07.03	.1016	-0.079					
2	07.08	.1016	-0.079					
4	05.88	.0844	-0.121					
5	05.08	.0950	-0.117					
6	07.78	.1117	-0.048					
7	49.31	.7137						
8	49.59	.7115						
9	49.59	.7115						
10	49.58	.7115						
11	49.48	.6958						
12	49.04	.7029						
13	47.78	.6857						
14	45.19	.6484						
15	17.99	.2582						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_f	β	Pic Run Test
PTO	60.63			16.0	-060.0	16 35 280-08
1	06.03	.0905	-0.079			
2	06.03	.0866	-0.115			
4	05.63	.0800	-0.181			
5	05.03	.0722	-0.155			
6	07.03	.1010	-0.075			
7	49.33	.6041				
8	49.73	.6008				
9	49.23	.6027				
10	47.63	.5940				
11	45.33	.5610				
12	44.03	.5333				
13	22.63	.3250				
14	11.03	.1594				
15	30.43	.4370				
PTO	60.68			20.0	-060.0	17 35 280-08
1	05.48	.0930	-0.007			
2	05.38	.0772	-0.141			
4	05.18	.0743	-0.150			
5	04.48	.0642	-0.177			
6	05.88	.0844	-0.121			
7	45.98	.6600				
8	46.18	.6627				
9	44.38	.6360				
10	41.18	.5910				
11	27.58	.3958				
12	20.98	.3011				
13	12.68	.1820				
14	16.48	.2365				
15	37.98	.5451				
PTO	60.78			23.0	-060.0	18 35 280-08
1	06.08	.1000	-0.078			
2	05.88	.0943	-0.122			
4	05.48	.0795	-0.138			
5	04.48	.0642	-0.178			
6	05.28	.0757	-0.154			
7	42.78	.6131				
8	42.28	.6069				
9	36.36	.5214				
10	29.58	.4230				
11	18.08	.2591				
12	17.38	.2491				
13	17.38	.2491				
14	13.98	.2003				
15	34.78	.4984				

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APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_μ	ϕ	Pic	Run	Test
PTO	69.58			00.0	-360.0	10	35	289-08
1	07.78	.1118	-0.045					
2	07.88	.1133	-0.041					
4	07.28	.1046	-0.065					
5	06.88	.0988	-0.081					
6	08.58	.1232	-0.013					
7	49.38	.7140						
8	49.78	.7154						
9	49.88	.7169						
10	49.98	.7183						
11	49.68	.7140						
12	49.98	.7183						
13	49.68	.7140						
14	49.38	.7097						
15	31.68	.4530						
PTO	69.91			00.0	-090.0	1	36	289-09
1	08.21	.1174	-0.029					
2	08.11	.1160	-0.033					
4	08.21	.1174	-0.029					
5	08.21	.1174	-0.029					
6	08.71	.1246	-0.009					
7	49.51	.7083						
8	49.61	.7098						
9	49.71	.7111						
10	49.81	.7125						
11	49.91	.7139						
12	49.91	.7125						
13	49.91	.7139						
14	49.81	.7125						
15	49.61	.7098						
PTO	69.91			-04.0	-090.0	2	36	289-09
1	08.11	.1160	-0.033					
2	07.91	.1131	-0.041					
4	07.71	.1103	-0.049					
5	07.71	.1103	-0.049					
6	08.31	.1189	-0.025					
7	49.61	.7098						
8	49.71	.7111						
9	49.61	.7098						
10	49.41	.7069						
11	49.41	.7069						
12	49.31	.7055						
13	49.71	.7069						
14	49.11	.7026						
15	49.01	.7055						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	69.86			00.0	-090.0	3	36	289-08
1	08.26	.1132	-0.027					
2	08.16	.1168	-0.031					
4	08.16	.1168	-0.031					
5	08.16	.1165	-0.031					
6	08.66	.1240	-0.011					
7	49.46	.7080						
8	49.56	.7094						
9	49.66	.7100						
10	49.76	.7123						
11	49.86	.7137						
12	49.76	.7123						
13	49.76	.7123						
14	49.66	.7100						
15	49.46	.7080						
PTO	69.86			04.0	-090.0	4	36	289-08
1	07.96	.1139	-0.029					
2	08.06	.1154	-0.035					
4	07.96	.1139	-0.039					
5	07.76	.1111	-0.047					
6	08.26	.1182	-0.027					
7	49.86	.7137						
8	49.76	.7123						
9	49.86	.7137						
10	49.86	.7137						
11	49.86	.7137						
12	49.86	.7137						
13	50.06	.7166						
14	50.06	.7166						
15	49.16	.7037						
PTO	69.86			08.0	-090.0	5	36	289-08
1	07.36	.1052	-0.063					
2	07.26	.1038	-0.067					
4	06.86	.0981	-0.083					
5	06.36	.0900	-0.103					
6	07.26	.1038	-0.067					
7	49.96	.7141						
8	50.06	.7156						
9	50.06	.7156						
10	50.06	.7156						
11	50.06	.7156						
12	50.16	.7170						
13	50.46	.7212						
14	50.56	.7227						
15	49.66	.7098						

APPENDIX E (CONT'D)
TABLE III CAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_μ	β	Pic	Run	Test
PTO	69.95			12.0	-180.0	6	36	289-08
1	07.06	.1030	-0.075					
2	05.66	.0952	-0.091					
4	06.36	.0909	-0.103					
5	06.06	.0866	-0.115					
6	07.56	.1081	-0.086					
7	49.96	.7141						
8	50.06	.7156						
9	50.06	.7156						
10	50.16	.7170						
11	50.06	.7156						
12	50.46	.7213						
13	49.06	.7141						
14	50.46	.7213						
15	49.06	.7127						
PTO	69.96			16.0	-090.0	7	36	289-09
1	07.46	.1068	-0.050					
2	05.96	.0853	-0.119					
4	04.76	.0681	-0.167					
5	05.16	.0738	-0.151					
6	05.56	.0795	-0.135					
7	49.66	.7100						
8	49.96	.7151						
9	49.86	.7137						
10	50.26	.7166						
11	49.46	.7080						
12	49.16	.7037						
13	47.76	.6837						
14	45.56	.6523						
15	43.96	.6279						
PTO	69.96			24.0	-090.0	8	36	289-08
1	07.66	.1096	-0.061					
2	05.96	.0853	-0.119					
4	04.96	.0710	-0.156					
5	05.06	.0724	-0.153					
6	04.96	.0710	-0.157					
7	49.96	.7137						
8	49.76	.7109						
9	49.96	.7066						
10	49.76	.7051						
11	47.96	.6837						
12	45.76	.6479						
13	37.66	.5351						
14	30.76	.4401						
15	26.16	.3715						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_L	ϕ	Pic	Run	Test
PTO	69.81			23.0	-[illegible]	6	36	289-08
1	68.21	.1176	-0.029					
2	66.11	.0879	-0.113					
4	65.51	.0789	-0.137					
5	65.51	.0789	-0.137					
6	64.01	.0574	-0.197					
7	49.31	.6892						
8	49.21	.7040						
9	49.11	.7035						
10	48.11	.6892						
11	43.21	.6190						
12	35.21	.5044						
13	25.31	.3626						
14	20.41	.2924						
15	33.61	.4814						
PTO	69.81			12.0	-[illegible]	10	36	289-09
1	67.16	.1026	-0.070					
2	66.66	.0954	-0.091					
4	66.26	.0897	-0.106					
5	66.06	.0868	-0.115					
6	67.56	.1083	-0.064					
7	49.86	.7147						
8	50.06	.7171						
9	49.96	.7157						
10	50.15	.7185						
11	49.96	.7157						
12	50.26	.7200						
13	49.96	.7163						
14	50.36	.7214						
15	49.76	.7129						
PTO	70.16			07.0	-[illegible]	11	36	289-08
1	68.46	.1206	-0.030					
2	68.16	.1163	-0.043					
4	68.26	.1177	-0.039					
5	68.26	.1177	-0.039					
6	68.76	.1249	-0.008					
7	49.66	.7121						
8	49.56	.7079						
9	49.76	.7093						
10	49.56	.7107						
11	50.06	.7185						
12	49.96	.7121						
13	49.96	.7121						
14	49.86	.7107						
15	49.66	.7079						

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APPENDIX E (CONT'D)
TABLE III CAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_f	β	Pic	Run	Test
PTO	69.96			00.0	-105.0	13	36	289-08
1	08.45	.1200	-0.019					
2	08.36	.1181	-0.027					
4	08.35	.1181	-0.027					
5	08.36	.1181	-0.027					
6	08.65	.1238	-0.011					
7	49.56	.7094						
8	49.66	.7098						
9	49.65	.7099						
10	49.66	.7107						
11	49.96	.7141						
12	49.76	.7113						
13	49.85	.7127						
14	49.86	.7127						
15	49.45	.7070						
PTO	69.91			-04.0	-105.0	13	36	289-09
1	08.81	.1180	-0.025					
2	08.81	.1146	-0.037					
4	07.81	.1117	-0.045					
5	07.71	.1103	-0.049					
6	08.61	.1217	-0.017					
7	49.51	.7082						
8	49.61	.7096						
9	49.51	.7082						
10	49.31	.7053						
11	49.31	.7053						
12	49.31	.7053						
13	49.41	.7068						
14	49.01	.7010						
15	49.31	.7053						
PTO	69.86			-04.0	-105.0	14	36	289-09
1	07.86	.1136	-0.039					
2	07.86	.1136	-0.039					
4	07.76	.1111	-0.047					
5	07.76	.1106	-0.051					
6	08.16	.1180	-0.031					
7	49.76	.7109						
8	49.76	.7109						
9	49.86	.7127						
10	49.96	.7137						
11	49.76	.7109						
12	49.86	.7127						
13	49.86	.7151						
14	49.86	.7151						
15	49.46	.7080						

APPENDIX E (CONT'D)
TABLE III CAL TEST 289-8 M = 2.00

TAP	P_t	$P_t/P_{t,o}$	$\Delta p/q$	α_μ	β	Pic	Run	Test
PTO	60.85			00.0	-105.0	15	36	289-00
1	07.56	.1082	-0.055					
2	07.26	.1039	-0.067					
4	06.76	.0959	-0.087					
5	06.26	.0896	-0.107					
6	07.06	.1011	-0.075					
7	49.96	.7151						
8	49.96	.7151						
9	49.96	.7151						
10	50.06	.7166						
11	49.96	.7151						
12	49.96	.7151						
13	50.06	.7166						
14	49.96	.7151						
15	41.96	.6020						
PTO	60.96			12.0	-105.0	16	36	289-00
1	07.46	.1066	-0.059					
2	06.86	.0981	-0.083					
4	05.46	.0780	-0.139					
5	05.06	.0723	-0.155					
6	05.16	.0738	-0.151					
7	49.96	.7141						
8	50.06	.7156						
9	49.96	.7137						
10	50.06	.7156						
11	49.66	.7098						
12	49.96	.7055						
13	49.96	.6994						
14	42.06	.7013						
15	43.16	.6284						
PTO	60.96			16.0	-105.	17	36	289-00
1	07.86	.1123	-0.043					
2	07.06	.1009	-0.075					
4	05.46	.0780	-0.139					
5	05.16	.0738	-0.151					
6	04.76	.0680	-0.167					
7	49.16	.7037						
8	49.56	.7094						
9	49.06	.7013						
10	49.16	.7027						
11	48.76	.6970						
12	47.66	.6813						
13	46.66	.6670						
14	37.66	.5385						
15	40.64	.5798						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	69.91			20.0	-105.0	13	36	289-08
1	08.41	.1203	-0.021					
2	07.11	.1017	-0.073					
4	05.91	.0245	-0.121					
5	05.71	.0517	-0.129					
6	04.91	.0629	-0.165					
7	49.61	.6553						
8	48.41	.6925						
9	47.11	.5730						
10	46.91	.6695						
11	41.71	.5966						
12	24.31	.3477						
13	14.31	.2047						
14	17.51	.2505						
15	37.21	.5323						
PTO	69.96			23.0	-105.0	19	36	289-08
1	08.76	.1254	-0.007					
2	07.46	.1066	-0.059					
4	06.56	.0939	-0.095					
5	06.16	.0882	-0.111					
6	04.96	.0710	-0.150					
7	47.65	.6922						
8	47.26	.6765						
9	44.66	.6395						
10	39.96	.5720						
11	21.26	.3043						
12	15.06	.2156						
13	12.56	.1798						
14	14.86	.2127						
15	33.36	.4775						
PTO	70.16			12.0	-105.0	20	36	289-08
1	07.76	.1106	-0.049					
2	06.96	.0992	-0.080					
4	05.36	.0764	-0.144					
5	05.16	.0736	-0.152					
6	04.96	.0598	-0.163					
7	49.75	.7092						
8	49.96	.7121						
9	49.46	.7050						
10	49.56	.7079						
11	48.06	.6864						
12	48.56	.6921						
13	47.06	.6709						
14	44.06	.6280						
15	43.36	.6180						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic Run Test
PTO	69.96			12.0	-105.0	21 36 289-08
1	07.46	.1066	-0.053			
2	06.86	.0981	-0.083			
4	05.46	.0780	-0.139			
5	04.96	.0709	-0.159			
6	05.16	.0738	-0.151			
7	49.96	.7141				
8	50.06	.7156				
9	49.86	.7127				
10	50.06	.7156				
11	49.66	.7098				
12	49.36	.7055				
13	49.66	.6994				
14	49.06	.7013				
15	48.16	.6884				
PTO	70.16			00.0	-105.0	22 36 289-09
1	08.36	.1192	-0.024			
2	08.26	.1177	-0.028			
4	08.26	.1177	-0.028			
5	08.26	.1177	-0.028			
6	08.66	.1234	-0.012			
7	49.66	.7079				
8	49.56	.7072				
9	49.76	.7093				
10	49.96	.7121				
11	49.86	.7107				
12	49.96	.7107				
13	49.96	.7121				
14	49.96	.7121				
15	49.45	.7050				
PTO	69.96			00.0	-105.0	23 36 289-09
1	08.56	.1224	-0.015			
2	08.26	.1181	-0.027			
4	08.26	.1181	-0.027			
5	08.26	.1181	-0.027			
6	08.66	.1238	-0.011			
7	49.45	.7070				
8	49.56	.7084				
9	49.76	.7113				
10	49.96	.7141				
11	49.86	.7127				
12	49.76	.7113				
13	49.86	.7127				
14	49.66	.7098				
15	49.26	.7041				

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APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	β	Pic	Run	Test
PTO	69.96			-04.0	-120.0	24	36	289-08
1	08.46	.1209	-0.019					
2	07.96	.1139	-0.033					
4	07.96	.1138	-0.039					
5	07.86	.1123	-0.043					
6	08.86	.1265	-0.003					
7	49.65	.7098						
8	49.75	.7113						
9	49.56	.7084						
10	49.46	.7070						
11	49.46	.7071						
12	49.15	.7027						
13	49.16	.7024						
14	49.06	.7013						
15	49.25	.7041						
PTO	69.96			04.0	-120.0	25	36	289-08
1	08.16	.1166	-0.031					
2	07.96	.1138	-0.039					
4	07.96	.1138	-0.039					
5	07.76	.1109	-0.047					
6	08.26	.1181	-0.027					
7	49.76	.7113						
8	49.86	.7127						
9	49.86	.7127						
10	49.96	.7141						
11	50.06	.7156						
12	50.06	.7156						
13	49.86	.7127						
14	49.86	.7127						
15	49.66	.7098						
PTO	69.81			00.0	-120.0	26	36	289-08
1	07.71	.1104	-0.040					
2	07.41	.1061	-0.051					
4	06.91	.0990	-0.070					
5	06.41	.0918	-0.101					
6	07.21	.1033	-0.069					
7	49.81	.7135						
8	49.91	.7149						
9	49.81	.7135						
10	49.81	.7149						
11	49.81	.7135						
12	49.81	.7135						
13	49.71	.7121						
14	49.81	.7063						
15	33.01	.4857						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run Test
PTO	70.11			12.0	-12[illegible]	[illegible]
1	07.71	.1100	-0.050			
2	07.31	.1043	-0.066			
4	06.31	.0900	-0.106			
5	05.71	.0816	-0.130			
6	06.41	.0914	-0.102			
7	49.81	.7105				
8	49.81	.7105				
9	49.41	.7047				
10	49.61	.7076				
11	49.01	.6990				
12	48.81	.6962				
13	47.51	.6777				
14	44.71	.6377				
15	17.71	.2525				
PTO	70.16			16.0	-120.0	28 36 289-09
1	08.11	.1156	-0.034			
2	07.61	.1085	-0.054			
4	06.41	.0914	-0.102			
5	06.11	.0871	-0.114			
6	06.61	.0942	-0.094			
7	49.21	.7014				
8	49.01	.6985				
9	49.01	.6943				
10	48.11	.6857				
11	46.21	.6591				
12	44.21	.6301				
13	22.41	.3195				
14	09.81	.1398				
15	27.61	.3936				
PTO	70.15			20.0	-120.0	28 36 289-09
1	08.31	.1256	-0.006			
2	08.41	.1199	-0.022			
4	05.91	.0885	-0.092			
5	05.91	.0871	-0.096			
6	07.11	.1013	-0.074			
7	47.01	.6700				
8	46.31	.6601				
9	43.41	.6187				
10	41.31	.5888				
11	30.91	.4406				
12	22.11	.3151				
13	17.41	.2481				
14	18.11	.2567				
15	32.21	.5446				

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	70.01			22.0	-120.0	30	36	289-08
1	00.46	.1351	-0.020					
2	00.86	.1266	-0.003					
4	07.56	.1080	-0.055					
5	07.46	.1066	-0.050					
6	07.56	.1080	-0.055					
7	43.06	.6276						
8	41.66	.5951						
9	35.06	.5008						
10	30.06	.4422						
11	22.76	.3251						
12	18.66	.2665						
13	21.66	.3094						
14	14.76	.2108						
15	32.96	.4936						
PTO	70.16			12.0	-120.0	31	36	289-08
1	07.71	.1008	-0.050					
2	07.31	.1042	-0.086					
4	06.31	.0800	-0.106					
5	05.71	.0814	-0.130					
6	06.41	.0914	-0.102					
7	49.01	.7114						
8	49.01	.7114						
9	48.61	.7071						
10	48.71	.7085						
11	48.01	.6985						
12	48.31	.7027						
13	47.61	.6777						
14	44.61	.6350						
15	17.31	.2467						
PTO	68.96			00.0	-120.0	32	36	289-08
1	08.46	.1200	-0.010					
2	08.16	.1166	-0.031					
4	08.26	.1181	-0.027					
5	08.26	.1181	-0.027					
6	08.66	.1238	-0.011					
7	48.46	.7176						
8	48.86	.7234						
9	48.36	.7127						
10	48.96	.7141						
11	48.36	.7127						
12	48.36	.7127						
13	48.36	.7127						
14	48.76	.7113						
15	48.26	.7041						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run Test
PTO	69.91			00.0	-135.0	33 26 289-03
1	08.51	.1217	-0.017			
2	08.21	.1174	-0.020			
4	08.21	.1174	-0.020			
5	08.21	.1174	-0.020			
6	08.71	.1246	-0.009			
7	49.51	.7082				
8	49.71	.7111				
9	49.81	.7125				
10	49.81	.7125				
11	49.71	.7111				
12	49.61	.7096				
13	49.41	.7068				
14	49.31	.7053				
15	49.21	.7039				
PTO	69.91			04.0	-135.0	34 36 289-03
1	08.31	.1189	-0.025			
2	08.11	.1160	-0.033			
4	08.01	.1146	-0.037			
5	07.91	.1131	-0.041			
6	08.41	.1203	-0.021			
7	49.61	.7096				
8	49.81	.7125				
9	49.81	.7125				
10	50.01	.7153				
11	49.91	.7139				
12	49.81	.7125				
13	49.71	.7111				
14	49.61	.7096				
15	49.61	.7096				
PTO	69.95			08.0	-135.0	33 34 289-03
1	07.86	.1123	-0.043			
2	07.65	.1095	-0.051			
4	07.36	.1052	-0.063			
5	07.56	.0995	-0.079			
6	07.76	.1109	-0.047			
7	49.56	.7084				
8	49.66	.7098				
9	49.56	.7084				
10	49.96	.7127				
11	49.76	.7113				
12	49.36	.7055				
13	49.56	.7084				
14	48.86	.6984				
15	47.16	.6741				

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	69.05			12.0	-135.0	36	36	289-08
1	07.06	.1123	-0.043					
2	07.56	.1091	-0.055					
4	07.06	.1003	-0.075					
5	06.66	.0952	-0.091					
6	07.65	.1035	-0.051					
7	40.41	.7370						
8	49.36	.7056						
9	48.06	.6984						
10	48.36	.6998						
11	48.16	.6984						
12	47.96	.6855						
13	46.46	.6561						
14	43.05	.6156						
15	21.75	.2110						
PTO	69.06			16.0	-135.0	37	36	289-09
1	08.36	.1195	-0.023					
2	07.86	.1123	-0.043					
4	07.36	.1052	-0.063					
5	07.16	.1023	-0.071					
6	08.36	.1195	-0.023					
7	48.76	.6970						
8	48.35	.6913						
9	46.66	.6670						
10	46.76	.6684						
11	44.46	.6355						
12	42.56	.6083						
13	37.35	.5340						
14	34.06	.4868						
15	23.66	.3384						
PTO	69.06			20.0	-135.0	38	36	289-09
1	08.36	.1195	-0.023					
2	08.46	.1209	-0.019					
4	08.06	.1152	-0.038					
5	08.06	.1152	-0.038					
6	08.36	.1194	-0.028					
7	46.76	.6684						
8	45.35	.6483						
9	43.76	.6255						
10	43.06	.6155						
11	39.06	.5583						
12	38.76	.5540						
13	38.16	.5455						
14	32.06	.4711						
15	21.46	.3067						

APPENDIX E (CONT'D)
TABLE III OAL TEST 289-8 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_L	ϕ	Pic	Run	Test
PTO	97.95			23.0	-135.1	39	36	289-08
1	00.96	.1434	0.041					
2	09.05	.1295	0.005					
4	09.96	.1266	-0.003					
5	09.95	.1266	-0.003					
6	10.16	.1452	0.040					
7	43.96	.5534						
8	43.66	.6008						
9	37.05	.5207						
10	37.76	.5307						
11	34.56	.4837						
12	34.76	.4860						
13	35.16	.5015						
14	26.76	.3725						
15	23.95	.3361						
PTO	77.11			17.1	-135.1	40	36	289-09
1	09.01	.1142	-0.030					
2	07.61	.1095	-0.054					
4	07.11	.1014	-0.074					
5	06.71	.0957	-0.090					
6	07.71	.1100	-0.050					
7	49.61	.7076						
8	49.61	.7069						
9	49.11	.6976						
10	49.01	.6962						
11	49.71	.7076						
12	49.11	.6985						
13	46.41	.6620						
14	42.01	.6130						
15	31.61	.4509						
PTO	79.06			20.1	-135.0	41	36	289-08
1	09.46	.1208	-0.020					
2	08.25	.1178	-0.038					
4	08.25	.1178	-0.038					
5	08.25	.1178	-0.038					
6	07.66	.1238	-0.013					
7	49.66	.7088						
8	49.76	.7103						
9	49.96	.7117						
10	49.86	.7117						
11	49.76	.7102						
12	49.56	.7074						
13	49.46	.7060						
14	49.36	.7045						
15	49.36	.7045						

OAL 289-10

APPENDIX E
TABULATED PRESSURE DATA
TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run	Test
PTO	72.33			[illegible]	[illegible]	1 29	289-10
1	09.18	.1269	-0.[illegible]2				
2	08.68	.1200	-0.[illegible]22				
4	08.88	.1228	-0.[illegible]14				
5	08.88	.1228	-0.[illegible]14				
6	09.0[illegible]	.1255	-0.[illegible]				
7	50.48	.6979					
8	49.88	.6895					
9	50.18	.6939					
10	50.68	.7007					
11	50.78	.7021					
12	50.78	.7021					
13	50.78	.7021					
14	50.98	.7048					
15	51.08	.7062					
PTO	72.13			[illegible]	[illegible]	2 29	289-10
1	09.08	.1259	-0.005				
2	08.68	.1204	-0.021				
4	08.88	.1231	-0.013				
5	08.88	.1231	-0.013				
6	09.08	.1259	-0.005				
7	50.28	.6971					
8	49.58	.6[illegible]					
9	50.[illegible]	.6[illegible]					
10	50.48	.6[illegible]					
11	50.68	.7026					
12	50.68	.7026					
13	50.68	.7026					
14	50.78	.7040					
15	50.88	.7054					
PTO	72.13			[illegible]	[illegible]	3 29	289-10
1	09.08	.1259	-0.005				
2	08.68	.1204	-0.021				
4	08.88	.1231	-0.013				
5	08.68	.1231	-0.021				
6	08.88	.1231	-0.013				
7	50.28	.7054					
8	50.68	.7026					
9	50.68	.7026					
10	50.68	.7026					
11	50.88	.7054					
12	50.88	.7054					
13	50.98	.7068					
14	50.98	.7068					
15	50.98	.7068					

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APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	72.38			00.0	-045.0	4	29	289-10
1	08.08	.1254	-0.007					
2	08.58	.1199	-0.022					
4	08.88	.1227	-0.014					
5	08.58	.1197	-0.022					
6	08.98	.1241	-0.010					
7	51.38	.7009						
8	51.48	.7112						
9	51.28	.7085						
10	51.38	.7099						
11	51.48	.7112						
12	51.38	.7098						
13	51.38	.7099						
14	51.28	.7085						
15	50.98	.7045						
PTO	72.23			00.0	-030.0	5	29	289-10
1	08.68	.1200	-0.021					
2	08.28	.1146	-0.037					
4	08.68	.1202	-0.021					
5	08.68	.1202	-0.021					
6	08.88	.1229	-0.014					
7	51.28	.7100						
8	51.38	.7110						
9	51.28	.7100						
10	51.48	.7127						
11	51.68	.7155						
12	51.48	.7127						
13	51.38	.7113						
14	51.38	.7113						
15	51.38	.7113						
PTO	72.23			04.0	-035.0	6	29	289-10
1	08.08	.1250	-0.006					
2	08.68	.1201	-0.021					
4	08.88	.1229	-0.014					
5	08.58	.1197	-0.025					
6	08.98	.1301	0.029					
7	51.18	.7091						
8	51.48	.7122						
9	51.48	.7122						
10	51.28	.7095						
11	51.38	.7109						
12	51.28	.7095						
13	51.28	.7095						
14	51.18	.7081						
15	51.08	.7067						

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.09

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	β	Pic	Run	Test
PTO	72.19			04.0	-040.0	7	29	289-10
1	08.08	.1244	-0.009					
2	08.68	.1293	-0.021					
4	08.89	.1230	-0.013					
5	09.48	.1175	-0.030					
6	09.58	.1260	0.005					
7	51.29	.7104						
8	51.49	.7132						
9	51.58	.7146						
10	51.49	.7132						
11	51.39	.7118						
12	51.38	.7118						
13	51.29	.7104						
14	51.10	.7091						
15	51.19	.7091						
PTO	72.18			04.0	-050.0	8	29	289-10
1	08.08	.1230	-0.013					
2	08.68	.1293	-0.021					
4	08.79	.1216	-0.017					
5	09.38	.1161	-0.033					
6	09.38	.1303	0.006					
7	51.49	.7132						
8	51.38	.7118						
9	51.58	.7146						
10	51.68	.7160						
11	51.78	.7174						
12	51.68	.7132						
13	51.38	.7118						
14	51.38	.7118						
15	51.18	.7091						
PTO	71.98			04.0	-055.0	9	29	289-10
1	08.89	.1234	-0.012					
2	08.58	.1193	-0.024					
4	08.68	.1206	-0.020					
5	09.28	.1151	-0.036					
6	09.18	.1275	-0.001					
7	51.29	.7104						
8	51.18	.7111						
9	51.49	.7153						
10	51.49	.7153						
11	51.58	.7167						
12	51.58	.7166						
13	51.38	.7138						
14	51.39	.7139						
15	51.08	.7098						

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	71.48							
1	08.68	.1214	-0.018					
2	08.38	.1177	-0.030					
4	08.48	.1196	-0.026					
5	08.18	.1144	-0.037					
6	08.93	.1243	-0.019					
7	51.08	.7146						
8	51.08	.7146						
9	51.03	.7145						
10	51.18	.7160						
11	51.28	.7178						
12	51.38	.7198						
13	51.33	.7188						
14	51.18	.7159						
15	50.88	.7117						
PTO	71.38							
1	08.73	.1220	-0.015					
2	08.33	.1167	-0.031					
4	08.43	.1181	-0.027					
5	08.13	.1138	-0.039					
6	08.73	.1220	-0.015					
7	51.03	.7140						
8	51.03	.7140						
9	51.13	.7155						
10	51.13	.7155						
11	51.23	.7177						
12	51.23	.7191						
13	51.23	.7177						
14	51.13	.7155						
15	50.83	.7131						
PTO	71.53							
1	08.58	.1193	-0.022					
2	08.28	.1150	-0.033					
4	08.38	.1173	-0.030					
5	08.08	.1116	-0.045					
6	08.68	.1213	-0.018					
7	51.03	.7141						
8	51.03	.7141						
9	51.13	.7156						
10	51.18	.7165						
11	51.18	.7165						
12	51.28	.7183						
13	51.28	.7183						
14	51.28	.7183						
15	50.88	.7119						

TABLE IV CAL TEST 299-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_L	ϕ	Pic	Run	Test
PTO	71.43			04.0	-155.0	13	20	299-10
1	69.50	.1201	-0.031					
2	69.18	.1145	-0.037					
4	69.49	.1197	-0.026					
5	69.18	.1145	-0.037					
6	69.69	.1215	-0.018					
7	69.68	.7005						
8	69.68	.7001						
9	69.48	.7057						
10	69.49	.7067						
11	69.69	.7021						
12	69.48	.7067						
13	69.49	.7067						
14	69.39	.7053						
15	69.78	.7039						
PTO	71.23			04.0	-155.0	14	20	299-10
1	69.50	.1206	-0.030					
2	69.28	.1162	-0.039					
4	69.58	.1206	-0.030					
5	69.39	.1170	-0.038					
6	69.78	.1215	-0.018					
7	69.88	.7109						
8	69.89	.7091						
9	69.88	.7091						
10	69.88	.7017						
11	69.89	.7017						
12	69.88	.7089						
13	69.78	.7089						
14	69.78	.7089						
15	69.68	.6978						
PTO	70.93			04.0	-155.0	15	20	299-10
1	69.69	.1196	-0.033					
2	69.19	.1153	-0.042					
4	69.49	.1196	-0.033					
5	69.49	.1134	-0.046					
6	69.69	.1253	-0.017					
7	69.98	.6969						
8	69.48	.6978						
9	69.49	.6987						
10	69.49	.6976						
11	69.68	.6969						
12	69.69	.6969						
13	69.69	.6969						
14	69.69	.6969						
15	69.38	.6969						

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	71.33			08.0	-180.0	16	29	289-10
1	08.48	.1166	-0.025					
2	08.08	.1133	-0.040					
4	08.48	.1189	-0.025					
5	08.58	.1202	-0.021					
6	09.18	.1277	0.003					
7	49.28	.6900						
8	49.08	.6881						
9	48.98	.6867						
10	49.08	.6881						
11	49.08	.6881						
12	48.98	.6867						
13	48.78	.6839						
14	48.68	.6825						
15	47.88	.6712						
PTO	71.33			08.0	-165.0	17	29	289-10
1	08.48	.1188	-0.025					
2	08.08	.1132	-0.041					
4	08.58	.1202	-0.021					
5	08.38	.1160	-0.033					
6	09.08	.1272	-0.002					
7	49.68	.6960						
8	49.68	.6960						
9	49.68	.6960						
10	49.88	.6988						
11	49.78	.6974						
12	49.78	.6974						
13	49.68	.6960						
14	49.48	.6932						
15	48.78	.6834						
PTO	71.33			08.0	-150.0	18	29	289-10
1	08.28	.1161	-0.033					
2	07.88	.1105	-0.049					
4	08.28	.1161	-0.033					
5	07.68	.1077	-0.056					
6	08.58	.1202	-0.021					
7	50.38	.7049						
8	50.38	.7063						
9	50.38	.7063						
10	50.58	.7091						
11	50.58	.7091						
12	50.48	.7077						
13	50.28	.7049						
14	49.88	.6993						
15	49.28	.6909						

APPENDIX E (CONT'D)

TABLE IV CAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
PTO	71.38			00.0	-070.0	19	29	289-10
1	00.00	.1132	-0.041					
2	07.68	.1076	-0.055					
4	07.58	.1062	-0.060					
5	07.18	.1006	-0.076					
6	00.33	.1174	-0.039					
7	50.93	.7142						
8	51.08	.7155						
9	51.10	.7170						
10	51.28	.7194						
11	51.09	.7156						
12	51.09	.7156						
13	51.39	.7196						
14	51.19	.7170						
15	41.79	.5853						
PTO	71.23			00.0	-065.0	20	29	289-10
1	00.10	.1143	-0.036					
2	07.88	.1106	-0.048					
4	07.68	.1078	-0.056					
5	07.28	.1022	-0.072					
6	00.68	.1205	-0.020					
7	50.78	.7120						
8	50.08	.7157						
9	50.08	.7157						
10	51.08	.7171						
11	50.88	.7143						
12	50.09	.7157						
13	51.08	.7171						
14	50.78	.7120						
15	39.08	.5472						
PTO	71.13			00.0	-060.0	21	29	289-10
1	00.18	.1150	-0.038					
2	07.98	.1122	-0.044					
4	07.68	.1080	-0.055					
5	07.38	.1038	-0.067					
6	00.78	.1234	-0.012					
7	50.68	.7135						
8	50.08	.7157						
9	50.08	.7157						
10	50.98	.7167						
11	50.78	.7130						
12	50.88	.7159						
13	50.98	.7153						
14	50.68	.7135						
15	39.08	.5354						

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APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
PTO	70.28			08.0	-055.0	22	29	289-10
1	08.28	.1168	-0.021					
2	07.98	.1126	-0.042					
4	07.68	.1084	-0.054					
5	07.38	.1041	-0.066					
6	08.78	.1233	-0.011					
7	50.58	.7126						
8	50.68	.7150						
9	50.68	.7150						
10	50.78	.7164						
11	50.58	.7136						
12	50.68	.7150						
13	50.68	.7150						
14	50.28	.7094						
15	40.68	.5738						
PTO	71.18			08.0	-052.0	23	29	289-10
1	08.38	.1177	-0.028					
2	08.08	.1135	-0.040					
4	07.88	.1107	-0.048					
5	07.38	.1037	-0.067					
6	08.68	.1218	-0.015					
7	50.78	.7134						
8	50.88	.7148						
9	50.88	.7148						
10	50.88	.7162						
11	50.68	.7120						
12	50.38	.7078						
13	50.78	.7134						
14	50.28	.7064						
15	45.88	.6446						
PTO	70.93			08.0	-042.0	24	29	289-10
1	08.38	.1181	-0.027					
2	08.18	.1152	-0.036					
4	07.98	.1125	-0.043					
5	07.18	.1012	-0.074					
6	08.48	.1196	-0.022					
7	50.18	.7075						
8	50.38	.7103						
9	50.58	.7131						
10	50.58	.7131						
11	50.58	.7131						
12	50.38	.7103						
13	50.18	.7075						
14	49.78	.7019						
15	49.18	.6934						

APPENDIX E (CONT'D)

TYPE IV OAL TEST 269-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	Δ_I/q	α_ℓ	ϕ	Pic	Run	Test
PTO	71.33			08.0	-035.0	25	29	269-10
1	08.48	.1180	-0.035					
2	08.28	.1161	-0.033					
4	08.08	.1132	-0.040					
5	07.28	.1021	-0.032					
6	08.58	.1202	-0.021					
7	50.10	.7025						
8	50.58	.7091						
9	50.78	.7119						
10	50.88	.7134						
11	50.68	.7105						
12	50.48	.7077						
13	50.22	.7040						
14	49.98	.7007						
15	49.48	.6937						
PTO	71.08			12.0	-035.0	26	29	269-10
1	07.78	.1005	-0.051					
2	07.48	.1053	-0.063					
4	06.18	.0866	-0.114					
5	04.88	.0687	-0.165					
6	04.48	.0630	-0.181					
7	49.28	.6908						
8	49.98	.7008						
9	49.98	.7008						
10	49.88	.7017						
11	48.88	.6877						
12	48.18	.6819						
13	48.08	.6764						
14	45.78	.6441						
15	26.38	.3711						
PTO	71.08			12.0	-040.0	27	29	269-10
1	07.68	.1010	-0.055					
2	07.38	.1024	-0.071					
4	05.88	.0827	-0.126					
5	04.78	.0672	-0.169					
6	05.28	.0742	-0.149					
7	49.78	.7003						
8	50.28	.7074						
9	50.18	.7060						
10	49.98	.7017						
11	48.68	.6877						
12	48.08	.6805						
13	47.68	.6708						
14	46.28	.6370						
15	26.88	.3782						

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_∞	ϕ	Pic	Run	Test
PTO	71.08			12.0	-050.1	28	29	289-10
1	07.48	.1052	-0.063					
2	07.00	.0996	-0.079					
4	06.08	.0855	-0.118					
5	05.48	.0771	-0.142					
6	06.98	.0968	-0.087					
7	50.28	.7074						
8	50.58	.7116						
9	50.48	.7102						
10	50.18	.7060						
11	48.28	.6933						
12	48.38	.6947						
13	47.78	.6732						
14	44.08	.6201						
15	19.88	.2797						
PTO	71.13			12.0	- 55.0	28	29	289-10
1	07.48	.1052	-0.063					
2	07.03	.0995	-0.079					
4	06.13	.0860	-0.114					
5	06.13	.0860	-0.114					
6	07.05	.0995	-0.079					
7	50.38	.7083						
8	50.68	.7125						
9	50.48	.7097						
10	50.38	.7083						
11	48.58	.6870						
12	48.68	.6884						
13	48.48	.6816						
14	45.28	.6366						
15	19.78	.2640						
PTO	71.08			12.0	- 60.0	31	29	289-10
1	07.38	.1038	-0.067					
2	07.08	.0996	-0.079					
4	06.28	.0884	-0.110					
5	05.58	.0787	-0.138					
6	06.18	.0871	-0.114					
7	50.28	.7074						
8	50.58	.7116						
9	50.58	.7116						
10	50.48	.7102						
11	48.78	.7003						
12	48.98	.7032						
13	48.18	.6918						
14	47.08	.6624						
15	19.18	.2698						

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run Test
PTO	70.98			12.0	-165.0 31 29 289-10	
1	07.28	.1026	-0.070			
2	07.18	.1012	-0.074			
4	06.28	.0885	-0.110			
5	06.58	.0941	-0.094			
6	08.78	.1237	-0.011			
7	50.18	.7070				
8	50.58	.7126				
9	50.68	.7140				
10	50.58	.7126				
11	49.98	.7041				
12	50.28	.7084				
13	49.78	.7013				
14	47.68	.6720				
15	28.28	.3984				
PTO	70.93			12.0	-071.0 32 29 289-10	
1	07.08	.0998	-0.078			
2	07.18	.1012	-0.074			
4	06.28	.0885	-0.110			
5	07.08	.0998	-0.078			
6	08.48	.1196	-0.023			
7	50.38	.7100				
8	50.68	.7145				
9	50.68	.7145				
10	50.68	.7145				
11	50.38	.7100				
12	50.08	.7060				
13	49.88	.7032				
14	47.68	.6720				
15	47.08	.6638				
PTO	71.02			12.0	-150.0 33 29 289-10	
1	07.38	.1166	-0.031			
2	07.78	.1095	-0.051			
4	07.38	.1166	-0.031			
5	07.88	.1196	-0.047			
6	09.08	.1378	0.000			
7	49.88	.7032				
8	49.98	.7084				
9	49.48	.6966				
10	49.78	.7013				
11	49.28	.6943				
12	48.98	.6896				
13	49.08	.6910				
14	46.68	.6572				
15	36.28	.5108				

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic	Run	Test
PTO	70.33			12.0	-180.0	34	29	289-10
1	08.58	.1211	-0.010					
2	08.02	.1141	-0.038					
4	08.38	.1256	-0.007					
5	08.88	.1256	-0.007					
6	09.09	.1295	0.033					
7	48.68	.6877						
8	47.98	.6774						
9	47.38	.6695						
10	46.98	.6636						
11	47.08	.6615						
12	48.78	.6887						
13	48.18	.6802						
14	47.38	.6674						
15	46.28	.6532						
PTO	70.03			12.0	-180.0	35	29	289-10
1	08.78	.1238	-0.011					
2	08.18	.1153	-0.035					
4	09.38	.1280	0.001					
5	09.38	.1322	0.013					
6	10.18	.1436	0.046					
7	48.08	.6810						
8	48.38	.6851						
9	47.68	.6733						
10	47.48	.6704						
11	46.58	.6567						
12	45.78	.6458						
13	44.28	.6247						
14	47.08	.6750						
15	46.38	.6536						
PTO	70.88			12.0	-180.0	36	29	289-10
1	09.13	.1285	0.005					
2	08.53	.1211	-0.019					
4	09.83	.1384	0.033					
5	10.53	.1483	0.064					
6	12.13	.1708	0.119					
7	49.38	.6957						
8	48.18	.6787						
9	47.08	.6643						
10	47.18	.6656						
11	45.88	.6467						
12	44.88	.6326						
13	43.88	.6050						
14	40.48	.5711						
15	41.88	.5909						

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APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	σ_ℓ	ϕ	Pic	Run	Test
PTO	79.83			16.0	-165.0	37	29	289-10
1	08.88	.1256	-0.007					
2	08.38	.1182	-0.027					
4	08.58	.1367	0.025					
5	09.88	.1395	0.033					
6	11.48	.1621	0.006					
7	47.88	.6760						
8	46.78	.6505						
9	45.28	.6393						
10	45.18	.6370						
11	47.08	.6647						
12	46.48	.6562						
13	44.38	.6336						
14	42.88	.6054						
15	41.28	.5828						
PTO	79.83			16.0	-15[illegible].0	38	29	289-10
1	08.48	.1197	-0.023					
2	08.03	.1141	-0.038					
4	08.88	.1254	-0.007					
5	08.88	.1254	-0.007					
6	10.18	.1437	0.044					
7	48.78	.6837						
8	49.18	.6943						
9	47.88	.6760						
10	45.08	.6788						
11	46.38	.6548						
12	46.38	.6548						
13	45.88	.6477						
14	44.68	.6308						
15	22.68	.3202						
PTO	79.83			16.0	-[illegible]70.0	39	29	289-10
1	05.88	.0830	-0.128					
2	05.98	.0844	-0.121					
4	05.28	.0745	-0.149					
5	07.08	.1000	-0.078					
6	05.58	.0928	-0.097					
7	49.48	.6986						
8	49.98	.7056						
9	49.78	.7028						
10	49.58	.7000						
11	48.18	.6802						
12	47.98	.6774						
13	44.68	.6308						
14	28.38	.4077						
15	39.08	.5517						

APPENDIX E (CONT'D)

TABLE IV CAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_L	ϕ	Pic Run Test
PTO	70.88			16.0	-065.0	42 29 289-10
1	05.79	.0815	-0.122			
2	06.23	.0886	-0.110			
4	05.69	.0801	-0.132			
5	06.08	.0859	-0.117			
6	06.78	.0957	-0.090			
7	49.40	.6981				
8	49.78	.7039				
9	49.48	.6981				
10	49.28	.6959				
11	47.58	.6719				
12	45.88	.6514				
13	39.69	.5609				
14	18.98	.2664				
15	32.38	.4567				
PTO	71.08			16.0	-060.0	41 29 289-10
1	06.78	.0954	-0.091			
2	06.18	.0860	-0.114			
4	05.98	.0841	-0.122			
5	05.98	.0841	-0.122			
6	07.18	.1010	-0.075			
7	49.38	.6947				
8	49.78	.7003				
9	49.38	.6947				
10	48.88	.6877				
11	46.88	.6595				
12	45.62	.6427				
13	29.68	.4176				
14	12.08	.1912				
15	25.08	.3527				
PTO	71.43			16.0	-055.0	42 29 289-10
1	06.89	.0968	-0.093			
2	06.13	.0965	-0.115			
4	05.98	.0933	-0.127			
5	05.68	.0937	-0.122			
6	07.48	.1047	-0.085			
7	49.38	.6913				
8	49.88	.6993				
9	49.38	.6913				
10	49.68	.6915				
11	46.28	.6479				
12	44.88	.6288				
13	26.19	.3665				
14	10.58	.1481				
15	30.38	.4259				

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run	Test
PTO	71.43			16.0	-050.0	43	289-10
1	06.98	.0963	-0.009				
2	06.18	.0965	-0.115				
4	05.48	.0767	-0.143				
5	06.28	.0879	-0.111				
6	07.38	.1037	-0.059				
7	49.13	.6985					
8	49.68	.6955					
9	49.09	.6871					
10	48.98	.6759					
11	45.49	.6267					
12	43.69	.5114					
13	27.98	.3917					
14	12.68	.1775					
15	35.53	.4981					
PTO	71.38			16.0	-040.0	44	289-10
1	06.88	.0964	-0.038				
2	06.78	.0950	-0.092				
4	03.98	.0558	-0.201				
5	04.09	.0573	-0.197				
6	06.98	.0964	-0.089				
7	48.68	.6820					
8	45.18	.6946					
9	48.68	.6820					
10	47.68	.6680					
11	44.98	.6301					
12	44.68	.6247					
13	42.28	.5928					
14	38.58	.5405					
15	23.68	.3316					
PTO	71.38			16.0	-030.0	45	289-10
1	05.98	.0974	-0.084				
2	06.58	.0964	-0.098				
4	02.78	.0389	-0.269				
5	03.63	.0509	-0.217				
6	06.88	.0964	-0.078				
7	48.27	.6943					
8	48.48	.6932					
9	48.08	.6848					
10	47.78	.6694					
11	45.18	.6330					
12	45.88	.6429					
13	44.58	.6245					
14	44.38	.6217					
15	26.78	.3752					

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic Run	Test
PIO	71.23			20.0	-135.0	46 29	289-10
1	06.28	.0[illegible]	-0.111				
2	06.68	.0[illegible]	-0.[illegible]				
4	02.98	.0418	-0.250				
5	04.28	.0[illegible]	-0.1[illegible]				
6	06.18	.0[illegible]	-0.115				
7	45.62	.6553					
8	47.28	.6[illegible]					
9	46.[illegible]	.6[illegible]					
10	45.18	.6743					
11	42.08	.5[illegible]					
12	42.[illegible]	.6020					
13	42.68	.5[illegible]					
14	41.4[illegible]	.5[illegible]23					
15	20.88	.2931					
PIO	71.28			20.0	-[illegible]	47 29	289-10
1	06.18	.0867	-0.115				
2	05.68	.0[illegible]7	-0.[illegible]				
4	04.[illegible]	.0572	-0.1[illegible]				
5	04.[illegible]	.0[illegible]	-0.1[illegible]				
6	05.48	.0[illegible]	-0.[illegible]				
7	4[illegible].38	.6[illegible]					
8	47.18	.5[illegible]					
9	45.78	.6[illegible]					
10	44.0[illegible]	.6[illegible]					
11	40.3[illegible]	.5[illegible]					
12	41.88	.5[illegible]75					
13	41.6[illegible]	.5[illegible]7					
14	40.28	.5[illegible]					
15	2[illegible].2[illegible]	.3266					
PIO	71.2[illegible]			2[illegible].0	-[illegible]	[illegible] 29	2[illegible]-10
1	06.48	.0[illegible]	-0.1[illegible]				
2	06.53	.0[illegible]	-0.[illegible]				
4	05.3[illegible]	.0755	-0.[illegible]				
5	05.3[illegible]	.0[illegible]	-0.[illegible]				
6	06.0[illegible]	.0[illegible]	-0.[illegible]				
7	46.[illegible]	.6[illegible]					
8	46.58	.6[illegible]					
9	44.[illegible]	.6212					
10	41.5[illegible]	.5[illegible]					
11	34.65	.4[illegible]					
12	33.2[illegible]	.4[illegible]					
13	31.39	.4479					
14	37.8[illegible]	.5314					
15	25.1[illegible]	.3533					

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APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic Run	Test
PTO	71.23			20.0	-055.0	49 29	289-10
1	06.38	.0896	-0.107				
2	06.40	.0910	-0.103				
4	05.78	.0811	-0.130				
5	05.48	.0760	-0.142				
6	06.68	.0930	-0.095				
7	46.48	.6525					
8	46.58	.6581					
9	44.68	.6273					
10	41.28	.5795					
11	31.98	.4476					
12	25.08	.3632					
13	23.48	.3296					
14	23.68	.3324					
15	38.98	.5472					
PTO	71.28			20.0	-060.0	50 29	289-10
1	05.28	.0741	-0.150				
2	06.08	.0853	-0.119				
4	05.58	.0783	-0.138				
5	05.48	.0760	-0.142				
6	06.28	.0881	-0.111				
7	47.18	.6619					
8	47.48	.6661					
9	45.78	.6423					
10	42.58	.6030					
11	30.08	.4220					
12	20.68	.2901					
13	12.08	.1695					
14	15.28	.2144					
15	38.58	.5412					
PTO	71.23			20.0	-065.0	51 29	289-10
1	05.48	.0760	-0.142				
2	05.88	.0825	-0.127				
4	05.18	.0727	-0.154				
6	06.08	.0854	-0.119				
7	47.08	.6722					
8	48.08	.6750					
9	46.78	.6567					
10	44.78	.6287					
11	37.98	.5332					
12	21.48	.3016					
13	08.98	.1261					
14	14.48	.2033					
15	38.68	.5430					
PTO	71.38			20.0	-070.0	52 29	289-10

TABLE IV OAL TEST 269-10 $M_\infty = 2.00$

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run Test
1	05.48	.0768	-0.142			
2	05.48	.0769	-0.142			
4	05.18	.0726	-0.154			
6	05.33	.0824	-0.127			
7	49.69	.6970				
8	49.80	.6949				
9	47.08	.6703				
10	46.69	.6540				
11	40.39	.5657				
12	24.79	.3473				
13	11.09	.1578				
14	16.03	.2252				
15	38.58	.5405				
PTO	71.59			20.0	-150.0	59 30 269-10
1	09.03	.1260	-0.002			
2	08.68	.1213	-0.019			
4	09.58	.1381	0.029			
6	11.60	.1632	0.066			
7	44.08	.6200				
8	43.39	.6065				
9	43.86	.6134				
10	44.10	.6176				
11	41.69	.5855				
12	41.48	.5790				
13	39.88	.5575				
14	37.29	.5210				
15	22.68	.3171				
PTO	71.43			20.0	-155.0	54 30 269-10
1	09.18	.1285	0.009			
2	09.08	.1271	-0.002			
4	10.98	.1539	0.069			
6	12.80	.1803	0.147			
7	47.59	.6675				
8	46.19	.6481				
9	44.88	.6171				
10	44.38	.6199				
11	42.18	.5905				
12	40.49	.5667				
13	41.39	.5775				
14	39.69	.5554				
15	37.79	.5290				
PTO	71.48			20.0	-160.0	56 30 269-10
1	09.88	.1382	0.029			
2	09.29	.1299	0.006			

TUNNEL IV OML TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_ℓ	ϕ	Pic Run Test
4	11.28	.1578	0.084			
6	13.38	.1872	0.144			
7	50.48	.7062				
8	40.08	.5606				
9	47.68	.6670				
10	45.09	.6306				
11	46.58	.6517				
12	45.38	.6349				
13	42.88	.5999				
14	39.68	.5551				
15	33.48	.4684				
PTC	71.49			23.0	-180.0	56 29 289-11
1	10.46	.1466	0.069			
2	09.88	.1382	0.060			
4	12.48	.1746	0.121			
6	14.58	.2006	0.229			
7	51.08	.7148				
8	40.68	.5690				
9	47.98	.6712				
10	45.68	.6393				
11	47.38	.6629				
12	45.78	.6405				
13	43.48	.6085				
14	39.88	.5576				
15	32.78	.4586				
PTO	71.53			23.0	-165.0	57 29 289-10
1	09.83	.1381	0.070			
2	09.76	.1367	0.065			
4	11.99	.1678	0.111			
6	14.48	.2026	0.209			
7	47.68	.6668				
8	46.08	.6443				
9	43.68	.6107				
10	44.38	.6190				
11	43.78	.6011				
12	40.48	.5646				
13	37.38	.5219				
14	34.48	.4820				
15	35.28	.4933				
PTO	71.43			23.0	-150.0	58 29 289-10
1	09.68	.1355	0.077			
2	09.18	.1285	0.062			
4	10.88	.1523	0.109			

APPENDIX E (CONT'D)

TABLE IV OAL TEST 289-10 M = 2.00

TAP	p_x	$p_x/p_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
6	12.98	.1817	0.151					
7	43.48	.6057						
8	41.48	.5807						
9	40.28	.5630						
10	42.08	.5801						
11	39.58	.5541						
12	38.78	.5420						
13	37.38	.5210						
14	34.68	.4855						
15	22.48	.3147						
PTO	71.48			23.0	-070.0	59	29	289-10
1	05.68	.0705	-0.135					
2	06.18	.0765	-0.115					
4	05.68	.0705	-0.135					
5	05.38	.0753	-0.147					
7	47.18	.6600						
8	47.38	.6624						
9	45.48	.6363						
10	41.33	.5780						
11	22.43	.3145						
12	15.88	.2222						
13	11.03	.1676						
14	13.88	.1942						
15	33.83	.4740						
PTO	71.38			23.0	-065.0	60	29	289-10
1	05.38	.0754	-0.146					
2	06.08	.0852	-0.119					
4	05.78	.0810	-0.131					
6	05.28	.0740	-0.150					
7	45.58	.6400						
8	45.88	.6428						
9	43.28	.6062						
10	31.48	.4410						
11	14.78	.2071						
12	18.08	.2532						
13	1[illegible].38	.1[illegible]						
14	1[illegible].48	.1[illegible]						
15	34.48	.4[illegible]						
PTO	71.63			23.0	-060.0	61	29	289-10
1	05.18	.0723	-0.155					
2	06.68	.0933	-0.096					
4	05.88	.0821	-0.128					
6	05.28	.0737	-0.151					
7	44.28	.6182						

TABLE IV OAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic Run Test
8	44.08	.6154				
9	38.58	.5386				
10	30.28	.4227				
11	18.53	.2594				
12	17.78	.2483				
13	15.48	.2301				
14	13.68	.1910				
15	33.52	.4967				
PTO	71.43			23.[illegible]	-055.6	67 29 289-10
1	05.13	.0718	-0.156			
2	06.53	.0914	-0.107			
4	05.93	.0833	-0.125			
6	05.42	.0760	-0.145			
7	42.88	.5986				
8	42.53	.5969				
9	38.13	.5330				
10	33.43	.4680				
11	23.43	.3280				
12	23.23	.3252				
13	26.33	.3686				
14	25.13	.3519				
15	36.53	.5114				
PTO	71.53			23.0	-05[illegible]	29 289-10
1	05.58	.0780	-0.139			
2	06.93	.0576	-0.084			
4	05.78	.0808	-0.131			
6	05.48	.0766	-0.143			
7	42.58	.5952				
8	43.13	.6037				
9	38.78	.5429				
10	35.58	.5126				
11	23.58	.3284				
12	30.18	.4219				
13	20.19	.3667				
14	35.98	.5016				
15	27.62	.3870				
PTO	71.58			23.0	-04[illegible]	64 29 289-10
1	05.98	.0836	-0.124			
2	07.10	.1002	-0.077			
4	04.05	.0570	-0.193			
6	05.40	.0766	-0.143			
7	42.98	.6004				
8	43.28	.6046				
9	40.68	.5711				

TABLE IV OAL TEST 289-10 M = 2.00

TAP	P_x	$P_x/P_{t,o}$	$\Delta p/q$	α_i	ϕ	Pic	Run	Test
10	39.78	.5557						
11	35.88	.5013						
12	38.18	.5334						
13	38.28	.5348						
14	36.78	.5139						
15	23.68	.3308						
PTO	71.53							
1	05.78	.0808	-0.131	23.0	-35.0	65	29	289-10
2	06.88	.0962	-0.088					
4	03.28	.0459	-0.229					
6	05.48	.0766	-0.143					
7	40.68	.5687						
8	42.98	.5998						
9	40.88	.5715						
10	40.08	.5603						
11	37.28	.5212						
12	38.18	.5477						
13	38.78	.5423						
14	36.78	.5142						
15	20.68	.2891						
PTO	71.53							
1	09.08	.1269	-0.033	00.0	00.0	66	29	289-10
2	08.58	.1199	-0.033					
4	08.88	.1241	-0.016					
6	09.08	.1269	-0.008					
7	49.88	.6972						
8	49.38	.6902						
9	49.68	.6944						
10	49.09	.6862						
11	50.18	.7015						
12	50.18	.7015						
13	50.18	.7015						
14	50.38	.7043						
15	50.38	.7043						

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OAL 289-19

APPENDIX B

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_1 \ y	0.169	0.369	0.569	0.769	0.969	ϕ_R	ϕ	Rake	Run
00	.7082	.7038	.7067	.7169	.7096	030	000	1	1
04	.6990	.6976	.7063	.7165	.7107				
08	.6731	.6825	.6971	.7103	.7059				
12	.6558	.6699	.6879	.6996	.6631				
16	.6122	.6285	.6052	.6402	.6504				
20	.4518	.5352	.5938	.6318	.6479				
23	.4251	.5304	.5977	.6372	.6548				
00	.7110	.7081	.7168	.7212	.7154	015	000	1	1
04	.6976	.6976	.7092	.7180	.7121				
08	.6910	.6825	.6955	.7086	.7057				
12	.6510	.6582	.6728	.6902	.6902				
16	.5735	.6025	.6330	.6665	.6796				
20	.5273	.5579	.5855	.6059	.5826				
23	.4870	.5276	.5654	.5451	.5668				
00	.7101	.7072	.7072	.7101	.7188	000	000	1	1
04	.7014	.7000	.7087	.7087	.7233				
08	.6844	.6873	.6989	.7119	.7105				
12	.4582	.6432	.6679	.6912	.6927				
16	.3872	.6268	.6297	.6457	.6552				
20	.3146	.5847	.5963	.6079	.6108				
23	.3291	.5353	.5469	.5556	.5484				
00	.7106	.7106	.7062	.7033	.7106	-015	000	1	1
04	.7043	.7057	.7043	.7057	.7086				
08	.5730	.6936	.6979	.7052	.7052				
12	.2664	.5842	.6510	.6800	.7003				
16	.5332	.2132	.3965	.5768	.6422				
20	.3872	.5440	.4235	.4670	.5295				
23	.4750	.4750	.3441	.4095	.4459				
00	.7106	.7106	.7106	.7091	.7062	-030	000	1	1
04	.7058	.7102	.7102	.7087	.7058				
08	.4380	.7008	.7052	.7052	.7037				
12	.3208	.6553	.6830	.6931	.6960				
16	.4601	.2116	.4165	.6272	.6665				
20	.5288	.1958	.1230	.2525	.4459				
23	.4357	.1696	.1478	.2525	.2525				
00	.7091	.7091	.7091	.7077	.7077	-040	000	1	1
04	.7038	.7096	.7096	.7096	.7082				
08	.6078	.7082	.7111	.7111	.7096				
12	.6820	.6936	.7024	.7038	.7067				
16	.5695	.5303	.6306	.6699	.6830				
20	.5004	.2718	.2412	.3359	.5893				
23	.4501	.2313	.2138	.2445	.2911				
00	.7092	.7092	.7107	.7078	.7078	-045	000	1	1
04	.7063	.7107	.7107	.7107	.7107				
08	.6947	.7107	.7136	.7136	.7121				
12	.6961	.7019	.7063	.7107	.7078				
16	.6514	.6145	.6611	.6859	.6947				
20	.5013	.3533	.4218	.5252	.6490				

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_4'/P_{t,o}$

α_1 / y	0.169	0.369	0.569	0.769	0.969	ϕ_R	ϕ	R.No	Run
23	.4640	.2732	.3140	.3140	.3461				
00	.7095	.7095	.7090	.7051	.7037	-.050	000	1	2
04	.7074	.7103	.7103	.7103	.7089				
08	.7086	.7138	.7124	.7138	.7124				
12	.6989	.7061	.7105	.7105	.7105				
16	.6120	.6324	.6717	.6906	.6994				
20	.5057	.3871	.5014	.6005	.6678				
23	.4707	.2775	.3493	.4433	.5645				
00	.7098	.7112	.7112	.7069	.7055	-.055	000	1	2
04	.7084	.7112	.7127	.7112	.7098				
08	.7134	.7163	.7163	.7140	.7105				
12	.7047	.7120	.7178	.7178	.7221				
16	.6203	.6436	.6829	.7032	.7105				
20	.5097	.4065	.5272	.6319	.6916				
23	.4741	.2780	.3553	.4741	.6078				
00	.7115	.7130	.7130	.7101	.7086	-.060	000	1	2
04	.7093	.7115	.7120	.7105	.7090				
08	.7130	.7174	.7159	.7159	.7130				
12	.7032	.7105	.7134	.7134	.7134				
16	.6173	.6377	.6756	.6946	.7033				
20	.5083	.3960	.5069	.6119	.6746				
23	.4719	.2807	.3478	.4383	.5535				
00	.7105	.7120	.7120	.7090	.7061	-.065	000	1	2
04	.7116	.7131	.7131	.7131	.7116				
08	.7116	.7160	.7160	.7160	.7160				
12	.6975	.7048	.7077	.7106	.7091				
16	.6080	.6226	.6640	.6897	.6970				
20	.5032	.3615	.4170	.5076	.6523				
23	.4657	.2820	.3140	.2849	.3126				
00	.7110	.7110	.7110	.7096	.7067	-.070	000	1	2
04	.7102	.7131	.7131	.7131	.7102				
08	.6989	.7121	.7135	.7135	.7135				
12	.6951	.7014	.7068	.7083	.7098				
16	.5890	.5861	.6445	.6766	.6897				
20	.5120	.3060	.2563	.3396	.6040				
23	.4565	.2563	.2271	.2534	.2855				
00	.7109	.7124	.7124	.7095	.7080	-.075	000	1	2
04	.7061	.7119	.7104	.7119	.7104				
08	.6421	.7120	.7120	.7134	.7120				
12	.6783	.6995	.7012	.7041	.7070				
16	.5640	.4038	.6077	.6830	.6819				
20	.5047	.2337	.1747	.2701	.5455				
23	.4478	.2147	.1914	.2395	.2759				
00	.7101	.7115	.7130	.7086	.7072	-.080	000	1	2
04	.7048	.7135	.7121	.7106	.7091				
08	.5112	.7061	.7090	.7120	.7090				
12	.5156	.6790	.6965	.7024	.7053				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_0 = 2.00$

$P_t'/P_{t,0}$

α_1 / y	0.169	0.369	0.569	0.769	0.969	ϕ_R	β	$\frac{B}{M}$	$\frac{S}{M}$
16	.5163	.2490	.4945	.6426	.6702				
20	.5317	.2076	.1285	.2463	.5300				
23	.4465	.1951	.1502	.2502	.2316				
00	.7143	.7143	.7143	.7114	.7071	-095	000	1	2
04	.7056	.7143	.7129	.7114	.7114				
08	.4259	.7031	.7090	.7104	.7104				
12	.2894	.6494	.6826	.6959	.6956				
16	.4393	.1263	.3739	.6180	.6586				
20	.5406	.2 53	.1515	.2662	.3794				
23	.4535	.1719	.1936	.2227	.2532				
00	.7114	.7129	.7129	.7100	.7071	-100	000	1	2
04	.7 51	.7124	.7109	.7109	.7109				
08	.4067	.6498	.7056	.7085	.7085				
12	.2515	.6200	.6722	.6856	.6954				
16	.4056	.1501	.3090	.5957	.6436				
20	.5414	.2506	.2593	.3102	.4062				
23	.4680	.1994	.3060	.2619	.3112				
00	.7119	.7119	.7104	.7090	.7075	-095	000	1	2
04	.7056	.7114	.7114	.7114	.7114				
08	.4309	.6969	.7042	.7071	.7085				
12	.2523	.5898	.6561	.6814	.6901				
16	.5185	.1533	.3221	.5671	.6276				
20	.5418	.4588	.4065	.3948	.4559				
23	.4872	.3313	.3284	.3429	.3677				
00	.7150	.7150	.7150	.7120	.7105	-100	000	1	3
04	.7140	.7155	.7140	.7125	.7096				
08	.7091	.7120	.7120	.7120	.7120				
08	.5722	.7018	.7062	.7106	.7092				
12	.2771	.5974	.6541	.6826	.6885				
16	.5230	.2226	.3947	.5726	.6222				
16	.5282	.1981	.3938	.5735	.6231				
20	.4254	.5542	.4254	.4693	.5015				
23	.5001	.5015	.3424	.4096	.4183				
00	.7137	.7137	.7137	.7108	.7108	-105	000	1	3
04	.7079	.7108	.7108	.7122	.7108				
08	.6452	.6962	.7020	.7049	.7049				
12	.3130	.5931	.6435	.6747	.6806				
16	.4201	.5121	.5034	.5910	.6202				
20	.2876	.4953	.5129	.5304	.5451				
23	.3670	.4340	.4560	.4736	.4707				
00	.7147	.7147	.7118	.7104	.7060	-110	000	1	3
04	.7086	.7115	.7115	.7115	.7115				
08	.6884	.6957	.7001	.7030	.7016				
12	.1850	.6108	.6518	.6723	.6797				
16	.2807	.5606	.5795	.6116	.6261				
20	.3532	.4891	.5504	.5622	.5637				
23	.3909	.4378	.4964	.5081	.5052				
00	.7153	.7153	.7123	.7109	.7065	-115	000	1	3

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 M_o = 2.00

$P_t'/P_{t,o}$

α_i \ y	0.169	0.369	0.569	0.769	0.969	ϕ_R	ϕ Rake	Rus
04	.7091	.7105	.7120	.7120	.7105			
08	.6907	.6966	.7009	.7039	.7009			
12	.4443	.6347	.6582	.6758	.6787			
16	.3794	.5981	.6083	.6259	.6317			
20	.3378	.5678	.5722	.5810	.5795			
23	.3780	.5213	.5125	.5257	.5183			
00	.7153	.7153	.7138	.7123	.7065	-120	000	1 3
04	.7089	.7104	.7118	.7104	.7085			
08	.6913	.6972	.7001	.7030	.7001			
12	.3921	.6491	.6636	.6767	.6811			
16	.3504	.6397	.6295	.6326	.6354			
20	.3096	.5578	.5722	.5881	.5823			
23	.3038	.5077	.5048	.5165	.5155			
00	.7164	.7150	.7135	.7106	.7048	-125	000	1 3
04	.7087	.7087	.7087	.7037	.7058			
08	.6902	.6946	.6990	.7019	.6990			
12	.5506	.6553	.6640	.6757	.6830			
16	.3271	.6271	.6271	.6315	.6432			
20	.3562	.5194	.5252	.5514	.5645			
23	.3045	.4840	.4942	.5293	.5351			
00	.7145	.7145	.7131	.7087	.7043	-130	000	1 3
04	.7072	.7086	.7086	.7072	.7043			
08	.6898	.6941	.6971	.6985	.7029			
12	.6548	.6592	.6650	.6767	.6825			
16	.4294	.5955	.6116	.6364	.6548			
20	.5154	.5256	.5372	.5664	.5766			
23	.4585	.4964	.5110	.5431	.5460			
00	.7151	.7136	.7092	.7092	.7063	-135	000	1 3
04	.7063	.7092	.7078	.7063	.7063			
08	.6864	.6923	.6952	.6967	.7011			
12	.6552	.6596	.6655	.6728	.6801			
16	.5793	.5925	.6118	.6377	.6553			
20	.5768	.5417	.5508	.5754	.5476			
23	.5063	.5063	.5223	.5150	.5253			
00	.7142	.7142	.7113	.7084	.7084	-150	000	1 3
04	.7041	.7071	.7070	.7041	.7070			
08	.6816	.6899	.6933	.6948	.6977			
12	.6511	.6670	.6728	.6816	.6879			
16	.6174	.6191	.6308	.6045	.6220			
20	.5429	.4931	.5400	.5839	.6074			
23	.5048	.4785	.5297	.5825	.6030			

APPENDIX B (CONTINUED)

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_i'/P_{t,o}$

α_i \ y	1.169	1.369	1.569	1.769	1.969	ϕ_R	ϕ	Rake	Run
00	.7038	.7038	.7038	.7038	.7005	030	000	1	1
04	.7049	.7034	.7034	.7019	.7019				
08	.6986	.6957	.6942	.6942	.6957				
12	.6660	.6733	.6806	.6850	.6594				
16	.6577	.6679	.6767	.6825	.6884				
20	.6595	.6714	.6801	.6889	.6948				
23	.6694	.6795	.6871	.6972	.7016				
00	.7096	.7096	.7096	.7096	.7067	015	000	1	1
04	.7078	.7092	.7078	.7063	.7049				
08	.7014	.7028	.7014	.6999	.6970				
12	.6888	.6931	.6917	.6787	.6771				
16	.6272	.6360	.6461	.6548	.6607				
20	.5957	.6131	.6749	.6379	.6437				
23	.5900	.6046	.6162	.6307	.6365				
00	.7115	.7072	.7043	.7014	.7014	000	000	1	1
04	.7116	.7073	.7073	.7043	.7029				
08	.7076	.7032	.7047	.7018	.7018				
12	.6927	.6912	.6927	.6956	.6956				
16	.6616	.6733	.6791	.6805	.6820				
20	.6195	.6355	.6224	.6311	.6021				
23	.5542	.5659	.5760	.5556	.5658				
00	.7120	.7135	.7077	.7033	.6990	-015	000	1	1
04	.7188	.7144	.7086	.7043	.7014				
08	.7154	.7125	.7081	.7037	.7008				
12	.7018	.7018	.7093	.6960	.6974				
16	.6640	.6728	.6757	.6844	.6902				
20	.5745	.6021	.6195	.6428	.6558				
23	.4793	.5201	.5506	.5826	.6146				
00	.7019	.6975	.7019	.7019	.7004	-030	000	1	1
04	.7043	.7029	.7073	.7058	.7087				
08	.7052	.7067	.7067	.7081	.7168				
12	.7019	.7048	.7135	.7150	.7135				
16	.6810	.7014	.7028	.7043	.7101				
20	.6233	.6524	.6684	.6890	.6844				
23	.3455	.6291	.6379	.6510	.6582				
00	.7048	.7033	.7004	.6975	.6960	-040	000	1	1
04	.7082	.7067	.7053	.7024	.7024				
08	.7096	.7067	.7053	.7053	.7053				
12	.7067	.7067	.7053	.7053	.7111				
16	.6917	.7004	.7062	.7091	.7106				
20	.6636	.6825	.6971	.7014	.7043				
23	.5420	.6543	.6747	.6820	.6849				
00	.7049	.7034	.7034	.7019	.7005	-045	000	1	1
04	.7107	.7092	.7078	.7078	.7078				
08	.7107	.7107	.7092	.7092	.7092				
12	.7107	.7107	.7092	.7107	.7136				
16	.6990	.7034	.7092	.7092	.7092				
20	.6810	.6941	.7000	.7014	.7029				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 9-19 $M_o = 2.00$

$P_t'/P_{t,o}$

a_1 \ y	1.169	1.369	1.569	1.769	1.969	β_2	ϕ	Rake	Run
23	.5936	.6752	.6883	.6971	.6985				
00	.7022	.7022	.7038	.6993	.6979	-050	000	1	2
04	.7074	.7074	.7060	.7060	.7060				
08	.7124	.7109	.7109	.7109	.7109				
12	.7134	.7121	.7121	.7134	.7163				
16	.7037	.7081	.7125	.7139	.7139				
20	.6918	.7011	.7026	.7040	.7055				
23	.6568	.6856	.6943	.6957	.6986				
00	.7040	.7026	.7026	.7011	.6997	-055	000	1	2
04	.7098	.7083	.7084	.7084	.7084				
08	.7120	.7120	.7120	.7120	.7134				
12	.7149	.7134	.7134	.7149	.7192				
16	.7134	.7149	.7163	.7178	.7178				
20	.7120	.7120	.7192	.7192	.7178				
23	.6804	.6949	.7063	.7080	.7037				
00	.7072	.7057	.7057	.7043	.7043	-060	000	1	2
04	.7105	.7105	.7076	.7076	.7076				
08	.7145	.7130	.7130	.7130	.7145				
12	.7134	.7134	.7134	.7134	.7178				
16	.7077	.7106	.7164	.7179	.7179				
20	.6965	.7038	.7082	.7097	.7097				
23	.6586	.6840	.6922	.6951	.6965				
00	.7047	.7047	.7032	.7018	.7032	-065	000	1	2
04	.7131	.7131	.7116	.7087	.7087				
08	.7146	.7146	.7131	.7116	.7131				
12	.7106	.7106	.7121	.7135	.7150				
16	.7043	.7073	.7121	.7160	.7175				
20	.6844	.6932	.7005	.7019	.7049				
23	.5925	.6654	.6829	.6858	.6887				
00	.7037	.7037	.7037	.7023	.7008	-070	000	1	2
04	.7131	.7116	.7116	.7087	.7087				
08	.7135	.7121	.7106	.7106	.7121				
12	.7127	.7127	.7127	.7127	.7171				
16	.6995	.7029	.7116	.7116	.7116				
20	.6603	.6807	.6917	.6961	.6975				
23	.5470	.6391	.6683	.6742	.6800				
00	.7080	.7066	.7051	.7022	.7022	-075	000	1	2
04	.7104	.7090	.7090	.7075	.7075				
08	.7134	.7120	.7134	.7134	.7149				
12	.7099	.7084	.7099	.7142	.7157				
16	.6936	.7008	.7067	.7067	.7096				
20	.6460	.6635	.6780	.6924	.6897				
23	.5440	.6168	.6518	.6635	.6722				
00	.7043	.7043	.7043	.7028	.7013	-080	000	1	2
04	.7106	.7106	.7091	.7077	.7077				
08	.7120	.7120	.7135	.7090	.7134				
12	.7082	.7082	.7140	.7140	.7111				

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 M_o = 2.00

P_t/P_{t_o}

α_i \ y	1.169	1.369	1.569	1.769	1.969	ϕ_R	ϕ	Rake No	Run
16	.6877	.6964	.7022	.7022	.7037				
20	.6242	.6446	.6649	.6766	.6853				
23	.3536	.5947	.6310	.6441	.6586				
[illegible]	.7056	.7071	.7056	.7027	.7013	-085	000	1	2
14	.7100	.7100	.7085	.7085	.7056				
18	.7104	.7090	.7090	.7075	.7104				
12	.7046	.7046	.7046	.7075	.7090				
16	.6761	.6848	.6935	.6969	.7022				
20	.5841	.6204	.6523	.6640	.6756				
23	.3635	.4811	.5865	.6204	.6407				
[illegible]	.7071	.7071	.7056	.7027	.6984	-090	000	1	2
14	.7100	.7080	.7085	.7041	.7022				
18	.7085	.7085	.7056	.7042	.7056				
12	.6997	.6997	.7012	.7055	.7099				
16	.6669	.6727	.6930	.6959	.7017				
20	.5283	.5981	.6417	.6562	.6707				
23	.3853	.4665	.5594	.5914	.6291				
[illegible]	.7061	.7046	.7017	.6973	.6944	-095	000	1	2
14	.7100	.7056	.7027	.6988	.7027				
18	.7071	.7042	.7027	.7056	.7056				
12	.6945	.6930	.7003	.7018	.7032				
16	.6552	.6669	.6814	.6916	.7003				
20	.5419	.5854	.6310	.6509	.6712				
23	.4004	.4945	.5513	.5964	.6256				
[illegible]	.7091	.7061	.7032	.7061	.7047	-100	000	1	3
14	.7095	.7047	.7032	.7052	.7037				
18	.7105	.7076	.7061	.7076	.7076				
12	.7092	.7077	.7106	.7121	.7136				
16	.6944	.7017	.7091	.7091	.7091				
20	.5502	.6714	.6870	.6937	.7010				
23	.4767	.5001	.5789	.5993	.6285				
[illegible]	.7064	.7049	.7049	.7020	.6991	-105	000	1	3
14	.7079	.7035	.7049	.7049	.7035				
18	.7020	.7035	.7049	.7035	.7035				
12	.6879	.6922	.6952	.6966	.7025				
16	.6524	.6611	.6726	.6874	.6918				
20	.5075	.6206	.6358	.6514	.6665				
23	.5148	.5265	.5598	.5764	.6028				
[illegible]	.7030	.7016	.7045	.7001	.6987	-110	000	1	3
14	.7056	.7086	.7086	.7056	.7042				
18	.7001	.7045	.7045	.7030	.7074				
12	.6999	.6914	.6958	.7002	.7002				
16	.6539	.6626	.6801	.6959	.6874				
20	.6104	.6207	.6455	.6499	.6689				
23	.5404	.5463	.5741	.5756	.5932				
[illegible]	.7036	.7065	.7065	.7036	.7065	-115	000	1	3

INDICATED TOTAL PRESSURE RATIOS FOR C&L TEST 239-19 $M_o = 2.00$

$P_t/P_{t,o}$

α_1 \ y	1.169	1.369	1.569	1.769	1.969	β_2	ϕ	Rake	Run
04	.7061	.7091	.7091	.7061	.7091				
08	.7024	.7053	.7038	.7082	.7053				
12	.6904	.6919	.6963	.6992	.6992				
16	.6552	.6655	.6846	.6816	.6875				
20	.6103	.6250	.6543	.6267	.6045				
23	.5476	.5505	.5783	.5768	.5710				
00	.7050	.7079	.7079	.7094	.7065	-120	000	1	3
04	.7089	.7104	.7089	.7147	.7089				
08	.7060	.7060	.7060	.7089	.7045				
12	.6913	.6927	.7030	.6986	.6971				
16	.6598	.6684	.6956	.6827	.6956				
20	.5895	.5996	.6270	.5953	.6155				
23	.5572	.5674	.5543	.5860	.5878				
00	.7077	.7077	.7077	.7106	.7048	-125	000	1	3
04	.7102	.7116	.7087	.7116	.7073				
08	.7048	.7048	.7106	.7077	.7033				
12	.6902	.6931	.7004	.6960	.6931				
16	.6679	.6738	.6898	.6388	.6534				
20	.5980	.5966	.5980	.6082	.6271				
23	.5701	.5497	.5760	.5877	.6081				
00	.7087	.7087	.7145	.7087	.7058	-130	000	1	3
04	.7086	.7086	.7144	.7101	.7057				
08	.7043	.7058	.7087	.7029	.7014				
12	.6912	.6912	.6985	.6927	.6798				
16	.6772	.6393	.6422	.6451	.6597				
20	.5795	.5897	.6116	.6203	.6393				
23	.5489	.5722	.5985	.6101	.6276				
00	.7078	.7092	.7136	.7092	.7063	-135	000	1	3
04	.7092	.7092	.7136	.7092	.7063				
08	.7040	.7040	.7055	.7011	.6996				
12	.6889	.6889	.6918	.6743	.6772				
16	.6173	.6319	.6480	.6524	.6640				
20	.5856	.6061	.6265	.6338	.6528				
23	.5735	.5939	.6173	.6275	.6465				
00	.7084	.7084	.7142	.7084	.7055	-150	000	1	3
04	.7085	.7099	.7143	.7070	.7041				
08	.6992	.6992	.7036	.6977	.6962				
12	.6626	.6714	.6816	.6831	.6875				
16	.6455	.6601	.6748	.6748	.6865				
20	.6396	.6572	.6704	.6748	.6894				
23	.6396	.6572	.6748	.6777	.6953				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

c_1 \ y	2.169	2.369	2.569	2.769	2.969	β_R	β	Rake	Run
00	.7009	.6995	.6980	.6966	.6951	030	000	1	1
04	.7019	.7005	.7006	.6990	.6976				
08	.6971	.7000	.7000	.7000	.7000				
12	.6938	.6981	.7011	.7025	.7055				
16	.6957	.6986	.7059	.7103	.7146				
20	.7006	.7065	.7138	.7211	.7241				
23	.7089	.7133	.7206	.7279	.7308				
00	.7052	.7037	.7023	.6994	.6965	015	000	1	1
04	.7034	.7019	.7005	.6961	.6961				
08	.6941	.6941	.6941	.6926	.6912				
12	.6800	.6815	.6844	.6859	.6888				
16	.6665	.6694	.6766	.6825	.6868				
20	.6539	.6597	.6684	.6786	.6830				
23	.6481	.6539	.6641	.6742	.6800				
00	.6999	.6999	.6970	.6941	.6897	000	000	1	1
04	.7014	.7000	.6956	.6927	.6912				
08	.7003	.6974	.6931	.6902	.6887				
12	.6927	.6898	.6830	.6810	.6825				
16	.6805	.6573	.6631	.6645	.6674				
20	.6166	.6239	.6340	.6428	.6515				
23	.5847	.5934	.6064	.6210	.6326				
00	.6975	.6960	.6946	.6931	.6902	-015	000	1	1
04	.6999	.6984	.6970	.6941	.6912				
08	.7008	.7008	.6994	.6979	.6950				
12	.6989	.6989	.6974	.6974	.6974				
16	.6931	.6946	.6975	.7004	.6990				
20	.6718	.6791	.6879	.6936	.6936				
23	.6437	.6524	.6640	.6757	.6786				
00	.7091	.7062	.7019	.6975	.6931	-030	000	1	1
04	.7160	.7102	.7058	.7043	.7014				
08	.7139	.7110	.7139	.7125	.7067				
12	.7135	.7164	.7135	.7091	.7077				
16	.7115	.7072	.7043	.7072	.7072				
20	.6873	.6873	.6902	.6960	.6975				
23	.6640	.6699	.6742	.6815	.6830				
00	.6946	.6931	.6902	.6888	.6931	-040	000	1	1
04	.6995	.6981	.6995	.7053	.7038				
08	.7038	.7111	.7126	.7111	.7082				
12	.7140	.7140	.7126	.7184	.7198				
16	.7208	.7208	.7179	.7179	.7179				
20	.7058	.7058	.7058	.7073	.7073				
23	.6893	.6908	.6908	.6952	.6952				
00	.6990	.6976	.6961	.6961	[illegible]	-045	000	1	1
04	.7049	.7049	.7078	.7049	[illegible]				
08	.7121	.7136	.7121	.7107	.7078				
12	.7121	.7107	.7092	.7092	.7078				
16	.7121	.7121	.7107	.7121	.7121				
20	.7073	.7145	.7131	.7174	.7174				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 229-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_1 \ y	2.169	2.369	2.569	2.769	2.969	β_n	β	$\frac{\beta}{\beta_n}$	$\frac{\beta}{\beta_n}$
23	.7014	.7029	.7029	.7058	.7073				
00	.6964	.6964	.6964	.6935	.6935	-050	000	1	?
04	.7045	.7031	.7045	.7060	.7031				
08	.7138	.7153	.7138	.7124	.7109				
12	.7163	.7149	.7134	.7134	.7120				
16	.7125	.7110	.7081	.7081	.7081				
20	.7084	.7084	.7069	.7098	.7127				
23	.7000	.7000	.7000	.7044	.7087				
00	.6997	.6982	.6982	.6997	.6997	-055	000	1	?
04	.7069	.7069	.7112	.7098	.7040				
08	.7149	.7178	.7163	.7149	.7134				
12	.7192	.7178	.7163	.7149	.7149				
16	.7178	.7163	.7134	.7149	.7149				
20	.7163	.7120	.7076	.7076	.7076				
23	.7066	.7066	.7037	.7066	.7066				
00	.7013	.6999	.6970	.6970	.6970	-060	000	1	?
04	.7061	.7047	.7061	.7061	.7047				
08	.7159	.7159	.7159	.7159	.7130				
12	.7192	.7192	.7163	.7134	.7134				
16	.7179	.7164	.7135	.7150	.7150				
20	.7126	.7126	.7111	.7111	.7111				
23	.6980	.6994	.6965	.7009	.7038				
00	.7018	.6989	.6960	.6960	.6960	-065	000	1	?
04	.7087	.7087	.7087	.7087	.7058				
08	.7160	.7189	.7175	.7160	.7146				
12	.7164	.7164	.7150	.7135	.7135				
16	.7189	.7160	.7131	.7131	.7131				
20	.7063	.7063	.7049	.7063	.7063				
23	.6916	.6931	.6916	.6975	.7019				
00	.6994	.6979	.6979	.6965	.6965	-070	000	1	?
04	.7087	.7087	.7102	.7087	.7043				
08	.7150	.7150	.7150	.7121	.7091				
12	.7171	.7171	.7156	.7156	.7127				
16	.7116	.7116	.7087	.7102	.7102				
20	.6990	.6990	.6990	.7034	.7034				
23	.6859	.6873	.6859	.6917	.6961				
00	.7022	.7008	.7008	.7022	.6993	-075	000	1	?
04	.7075	.7075	.7090	.7075	.7031				
08	.7149	.7149	.7134	.7120	.7090				
12	.7128	.7099	.7070	.7070	.7070				
16	.7081	.7067	.7067	.7096	.7081				
20	.6955	.6955	.6955	.6999	.7013				
23	.6780	.6809	.6809	.6853	.6926				
00	.6999	.6984	.6999	.6999	.6955	-080	000	1	?
04	.7077	.7091	.7077	.7033	.6989				
08	.7120	.7090	.7061	.7061	.7061				
12	.7082	.7082	.7111	.7082	.7082				

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 M_0 = 2.00

P_t/P_{t_0}

α_1 \ y	2.169	2.369	2.569	2.769	2.969	β_R	ϕ Rake	ϕ Ring
16	.7080	.7066	.7051	.7051	.7051			
20	.6896	.6911	.6911	.6984	.6998			
24	.6673	.6732	.6761	.6819	.6833			
00	.6998	.6969	.6969	.6940	.6925	-085	000	1 2
04	.7071	.7056	.7027	.7027	.6998			
08	.7075	.7104	.7104	.7075	.7046			
12	.7104	.7104	.7090	.7075	.7061			
16	.7061	.7051	.7037	.7109	.7080			
20	.6814	.6911	.6886	.6930	.6930			
24	.6582	.6611	.6611	.6698	.6756			
00	.6954	.6925	.6954	.6940	.6940	-090	000	1 2
04	.7008	.7037	.7051	.7022	.6993			
08	.7085	.7085	.7085	.7071	.7035			
12	.7099	.7099	.7071	.7128	.7084			
16	.7046	.7104	.7061	.7061	.7031			
20	.6838	.6853	.6824	.6911	.6940			
24	.6436	.6494	.6552	.6669	.6727			
00	.6988	.6959	.6959	.6930	.6930	-095	000	1 2
04	.7027	.7013	.6998	.7027	.7027			
08	.7056	.7056	.7128	.7085	.7027			
12	.7061	.7120	.7090	.7047	.7018			
16	.7076	.7032	.7003	.7032	.7003			
20	.6800	.6814	.6829	.6916	.6945			
24	.6402	.6489	.6567	.6693	.6751			
00	.7032	.7032	.7047	.7032	.6973	-100	000	1 3
04	.7027	.7008	.7037	.7022	.6964			
08	.7091	.7091	.7105	.7032	.6973			
12	.7136	.7136	.7077	.7049	.7018			
16	.7105	.7061	.7032	.7032	.7003			
20	.7010	.6995	.6966	.6981	.6952			
24	.6720	.6991	.6976	.6991	.6962			
28	.6772	.6831	.6860	.6933	.6889			
32	.6460	.6553	.6621	.6723	.6752			
00	.6976	.7020	.6962	.6918	.6889	-105	000	1 3
04	.7047	.7020	.6976	.6933	.6903			
08	.7064	.7020	.6991	.6976	.6962			
12	.6995	.6981	.6966	.6981	.6952			
16	.6918	.6933	.6933	.6933	.6845			
20	.6767	.6884	.6796	.6499	.6504			
24	.6205	.5852	.5926	.6073	.6146			
00	.7030	.6987	.6943	.6928	.6884	-110	000	1 3
04	.7056	.6998	.6958	.6953	.6909			
08	.7091	.7001	.6972	.6913	.6884			
12	.6959	.6943	.6899	.6870	.6841			
16	.6859	.6859	.6772	.6684	.6728			
20	.6762	.6207	.6324	.6426	.6455			
24	.5741	.5946	.6020	.6166	.6210			
00	.7006	.6962	.6948	.6918	.6889	-115	000	1 3

APPENDIX B (CONTINUED)

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 229-19 $M_o = 2.00$

$P_t/P_{t,o}$

c_1 \ y	2.169	2.369	2.569	2.769	2.969	β_R	β	$\frac{P}{H}$	$\frac{H}{H}$
04	.7032	.7003	.6973	.6944	.6885				
08	.7009	.6980	.6951	.6893	.6849				
12	.6963	.6919	.6846	.6831	.6816				
16	.6846	.6582	.6611	.6655	.6714				
20	.6162	.6279	.6367	.6469	.6513				
23	.5856	.6031	.6090	.6236	.6280				
00	.7006	.6977	.6948	.6918	.6889	-120	000	1	3
04	.7030	.6987	.6972	.6928	.6884				
08	.7001	.6972	.6928	.6884	.6840				
12	.6927	.6840	.6781	.6811	.6796				
16	.6512	.6555	.6598	.6670	.6698				
20	.6242	.6357	.6415	.6545	.6588				
23	.6009	.6155	.6213	.6344	.6373				
00	.7033	.7004	.6990	.6960	.6931	-125	000	1	3
04	.7058	.7014	.6971	.6941	.6883				
08	.7019	.6960	.6902	.6873	.6844				
12	.6844	.6815	.6786	.6800	.6800				
16	.6563	.6621	.6650	.6708	.6738				
20	.6344	.6446	.6475	.6592	.6650				
23	.6198	.6314	.6373	.6490	.6519				
00	.7029	.7014	.7000	.6956	.6912	-130	000	1	3
04	.7028	.7014	.6984	.6955	.6897				
08	.7000	.6941	.6927	.6912	.6883				
12	.6810	.6825	.6825	.6839	.6839				
16	.6626	.6699	.6713	.6772	.6786				
20	.6466	.6538	.6568	.6655	.6684				
23	.6364	.6466	.6509	.6640	.6655				
00	.7034	.7019	.7005	.6976	.6917	-135	000	1	3
04	.7034	.7019	.6990	.6947	.6917				
08	.6967	.6938	.6938	.6923	.6923				
12	.6801	.6831	.6860	.6875	.6875				
16	.6684	.6757	.6786	.6845	.6859				
20	.6587	.6674	.6689	.6791	.6791				
23	.6524	.6626	.6640	.6757	.6786				
00	.7025	.6996	.6981	.6938	.6908	-150	000	1	3
04	.7026	.7011	.7011	.6982	.6953				
08	.6948	.6962	.6977	.6977	.6962				
12	.6904	.6934	.6963	.6992	.7022				
16	.6894	.6953	.6997	.7070	.7070				
20	.6924	.7011	.7041	.7129	.7129				
23	.6982	.7055	.7070	.7158	.7129				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t/P_{t,o}$

ψ \ y	3.169	3.369	α_n	β	Rake	Run
00	.6893	.6907	030	000	1	1
04	.6932	.6932				
08	.7000	.6971				
12	.7084	.7084				
16	.7161	.7176				
20	.7255	.7270				
23	.7308	.7323				
00	.6907	.6921	015	000	1	1
04	.6917	.6844				
08	.6897	.6897				
12	.6902	.6917				
16	.6883	.6926				
20	.6830	.6873				
23	.6771	.6829				
00	.6839	.6854	000	000	1	1
04	.6854	.6796				
08	.6858	.6844				
12	.6796	.6810				
16	.6689	.6747				
20	.6529	.6645				
23	.6340	.6413				
00	.6844	.6844	-015	000	1	1
04	.6868	.6796				
08	.6892	.6892				
12	.6960	.6902				
16	.6946	.6902				
20	.6805	.6834				
23	.6699	.6524				
00	.6873	.6873	-030	000	1	1
04	.6941	.6854				
08	.7008	.6965				
12	.7048	.7048				
16	.7043	.7028				
20	.6917	.6990				
23	.6815	.6873				
00	.6931	.6902	-040	000	1	1
04	.6980	.6893				
08	.7053	.7126				
12	.7198	.7184				
16	.7120	.7120				
20	.7000	.7000				
23	.6849	.6908				
00	.6903	.6874	-045	000	1	1
04	.6961	.6888				
08	.7034	.7019				
12	.7063	.7092				
16	.7092	.7092				
20	.7116	.7102				

INDICATED TOTAL PRESSURE RATIOS FOR O.L TEST 289-29 $M_o = 2.00$

α_1 / y	$P_t'/P_{t,o}$ 3.169	3.369	β_R	β	Rake	Run
23	.6971	.6971				
00	.6920	.6906	-050	000	1	2
04	.6973	.6970				
08	.7095	.7066				
12	.7090	.7076				
16	.7052	.7052				
20	.7055	.7055				
23	.7072	.7072				
00	.6924	.6895	-055	000	1	2
04	.6997	.6974				
08	.7105	.7076				
12	.7134	.7120				
16	.7105	.7105				
20	.7047	.7047				
23	.6949	.6949				
00	.6941	.6911	-060	000	1	2
04	.6989	.6930				
08	.7101	.7057				
12	.7120	.7120				
16	.7121	.7106				
20	.7053	.7067				
23	.6980	.6965				
00	.6916	.6887	-065	000	1	2
04	.7014	.6956				
08	.7116	.7087				
12	.7121	.7121				
16	.7087	.7087				
20	.6993	.6993				
23	.6960	.6960				
00	.6921	.6877	-070	000	1	2
04	.7000	.6941				
08	.7077	.7048				
12	.7083	.7068				
16	.7058	.7073				
20	.7005	.7005				
23	.6917	.6902				
00	.6935	.6916	-075	000	1	2
04	.6973	.6901				
08	.7047	.7018				
12	.7070	.7041				
16	.7052	.7037				
20	.6984	.6999				
23	.6897	.6897				
00	.6897	.6868	-080	000	1	2
04	.6931	.6873				
08	.7047	.7003				
12	.7067	.7053				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 M_o = 2.00

α_i \ y	$P_t'/P_{t,o}$ 3.169	3.369	β_R	ϕ	Rake	Run
16	.7051	.7066				
20	.6954	.6940				
23	.6790	.6804				
00	.6882	.6882	-085	000	1	2
04	.6954	.6887				
08	.7031	.6988				
12	.7090	.7046				
16	.7027	.6993				
20	.6930	.6930				
23	.6755	.6770				
00	.6882	.6867	-090	000	1	2
04	.6935	.6906				
08	.7056	.6969				
12	.7041	.6997				
16	.6988	.6959				
20	.6940	.6911				
23	.6756	.6785				
00	.6915	.6901	-095	000	1	2
04	.6940	.6853				
08	.6959	.6911				
12	.6989	.6945				
16	.6974	.6945				
20	.6901	.6858				
23	.6766	.6751				
00	.6885	.6856	-100	000	1	3
00	.6875	.6861				
04	.6914	.6870				
08	.6959	.6900				
12	.6959	.6930				
16	.6893	.6849				
16	.6903	.6859				
20	.6831	.6567				
23	.6519	.6373				
00	.6830	.6845	-105	000	1	3
04	.6874	.6816				
08	.6903	.6859				
12	.6893	.6835				
16	.6728	.6757				
20	.6562	.6518				
23	.6234	.6293				
00	.6826	.6826	-110	000	1	3
04	.6880	.6777				
08	.6855	.6826				
12	.6841	.6841				
16	.6729	.6742				
20	.6528	.6558				
23	.6313	.6342				
00	.6816	.6831	-115	000	1	3

INDICATED TOTAL PRESSURE RATIOS FOR CnL TEST 289-19 $M_o = 2.00$

$P_4/P_{t,o}$

q_1/y	3.169	3.369	α_R	β	Rake	Run
04	.6841	.6768				
08	.6835	.6820				
12	.6816	.6846				
16	.6758	.6772				
20	.6572	.6601				
23	.6382	.6411				
00	.6816	.6831	-120	000	1	3
04	.6826	.6767				
08	.6826	.6826				
12	.6811	.6811				
16	.6784	.6798				
20	.6660	.6674				
23	.6475	.6505				
00	.6844	.6844	-125	000	1	3
04	.6825	.6767				
08	.6830	.6815				
12	.6815	.6930				
16	.6796	.6825				
20	.6723	.6738				
23	.6606	.6636				
00	.6854	.6883	-130	000	1	3
04	.6868	.6810				
08	.6869	.6854				
12	.6869	.6869				
16	.6844	.6859				
20	.6801	.6830				
23	.6757	.6772				
00	.6859	.6859	-135	000	1	3
04	.6888	.6844				
08	.6908	.6908				
12	.6918	.6918				
16	.6933	.6933				
20	.6879	.6908				
23	.6903	.6918				
00	.6864	.6879	-150	000	1	3
04	.6924	.6894				
08	.6977	.6948				
12	.7051	.7051				
16	.7158	.7158				
20	.7217	.7217				
23	.7246	.7275				

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_t/P_{t,o}$

α_1 \ y	0.069	0.269	0.469	0.669	0.869	β_R	ϕ	Rake	Run
00	.7082	.7082	.7067	.7067	.7038	030	000	5	1
04	.7034	.7034	.7019	.7019	.7005				
08	.6971	.6971	.6986	.6986	.7000				
12	.7084	.7098	.7128	.7142	.7157				
16	.7307	.7336	.7380	.7409	.7438				
20	.7563	.7694	.7752	.7797	.7811				
23	.7806	.7996	.8084	.8084	.8084				
00	.7110	.7125	.7096	.7096	.7067	015	000	5	1
04	.7063	.7063	.7049	.7034	.7034				
08	.7101	.7086	.7072	.7072	.7057				
12	.7324	.7280	.7237	.7222	.7222				
16	.7600	.7551	.7537	.7537	.7537				
20	.7862	.7949	.7964	.7920	.7920				
23	.8135	.8251	.8251	.8208	.8193				
00	.7072	.7072	.7072	.7086	.7072	000	000	5	1
04	.7058	.7058	.7029	.7029	.7029				
08	.7148	.7119	.7105	.7076	.7090				
12	.7393	.7349	.7291	.7247	.7247				
16	.7676	.7618	.7589	.7575	.7575				
20	.7909	.8010	.7996	.7952	.7938				
23	.8228	.8330	.8266	.8228	.8199				
00	.7077	.7062	.7048	.7048	.7048	-015	000	5	1
04	.7043	.7043	.7028	.6999	.6999				
08	.7067	.7081	.7067	.7052	.7037				
12	.7279	.7294	.7250	.7221	.7207				
16	.7542	.7542	.7528	.7528	.7528				
20	.7764	.7923	.7909	.7865	.7865				
23	.8037	.8226	.8197	.8168	.8124				
00	.7077	.7062	.7048	.7033	.7019	-030	000	5	1
04	.7014	.7014	.7014	.7000	.7000				
08	.6921	.6979	.6979	.6994	.6994				
12	.7104	.7120	.7106	.7106	.7106				
16	.7159	.7333	.7319	.7333	.7362				
20	.7309	.7644	.7659	.7673	.7673				
23	.7484	.7920	.7935	.7935	.7906				
00	.7062	.7062	.7033	.6990	.6975	-040	000	5	1
04	.6995	.6995	.6995	.6966	.6936				
08	.6791	.6878	.6907	.6907	.6907				
12	.6733	.6966	.6980	.6980	.6980				
16	.6815	.7120	.7135	.7179	.7208				
20	.6898	.7364	.7437	.7480	.7509				
23	.6995	.7623	.7666	.7710	.7798				
00	.7063	.7078	.7019	.6961	.7049	-045	000	5	1
04	.6990	.7005	.6976	.6932	.6932				
08	.6713	.6830	.6844	.6844	.6844				
12	.6553	.6830	.6874	.6903	.6903				
16	.6568	.6961	.6990	.7063	.7165				
20	.6592	.7174	.7247	.7335	.7451				

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

α_1 \ y	$P_t'/P_{t,o}$ 0.069	0.269	0.469	0.669	0.869	ϕ_R	ϕ	Rake	Run
23	.6636	.7378	.7451	.7611	.7670				
00	.7037	.7037	.7008	.6949	.7008	-050	000	5	2
04	.6987	.6987	.6973	.6915	.6944				
08	.6688	.6790	.6819	.6804	.6833				
12	.6392	.6741	.6800	.6843	.6887				
16	.6324	.6819	.6863	.6950	.7081				
20	.6316	.6982	.7098	.7257	.7359				
23	.6308	.7159	.7274	.7491	.7620				
00	.7055	.7055	.6997	.6982	.7069	-055	000	5	2
04	.6968	.6997	.6982	.6939	.7011				
08	.6683	.6741	.6770	.6756	.6872				
12	.6203	.6625	.6683	.6756	.6887				
16	.6059	.6640	.6727	.6858	.7003				
20	.5999	.6756	.6901	.7149	.7338				
23	.5933	.6906	.7066	.7313	.7501				
00	.7072	.7072	.7028	.7086	.7174	-060	000	5	2
04	.6930	.6960	.6945	.7018	.7105				
08	.6664	.6780	.6766	.6839	.6941				
12	.6014	.6494	.6581	.6741	.6872				
16	.5808	.6479	.6581	.6800	.7004				
20	.5696	.6528	.6703	.6994	.7199				
23	.5579	.6644	.6849	.7155	.7345				
00	.7047	.7047	.7003	.7090	.7163	-065	000	5	2
04	.6927	.6970	.6956	.7058	.7131				
08	.6635	.6766	.6795	.6868	.6956				
12	.5721	.6290	.6421	.6639	.6814				
16	.5481	.6255	.6401	.6664	.6868				
20	.5310	.6245	.6479	.6815	.7019				
23	.5167	.6333	.6639	.7048	.7150				
00	.7037	.7037	.7067	.7168	.7139	-070	000	5	2
04	.6927	.6970	.6985	.7116	.7110				
08	.6596	.6742	.6756	.6887	.6916				
12	.5562	.6162	.6398	.6571	.6747				
16	.5160	.6021	.6211	.6532	.6737				
20	.4959	.5982	.6289	.6727	.6844				
23	.4784	.6026	.6391	.6829	.6946				
00	.7051	.7037	.7109	.7167	.7124	-075	000	5	2
04	.6901	.6930	.7017	.7133	.7104				
08	.6596	.6741	.6872	.7018	.6960				
12	.6229	.5997	.6229	.6591	.6635				
16	.4912	.5815	.6106	.6513	.6601				
20	.4595	.5702	.6066	.6518	.6664				
23	.4406	.5717	.6125	.6591	.6751				
00	.7043	.7028	.7101	.7159	.7101	-080	000	5	2
04	.6931	.6946	.7048	.7135	.7106				
08	.6596	.6741	.6887	.7032	.6974				
12	.6352	.6090	.6177	.6528	.6615				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 239-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_1 \ y	0.069	0.269	0.469	0.669	0.869	β_2	β	$\frac{\beta}{\alpha_1}$	$\frac{\beta}{\alpha_2}$
16	.5715	.5584	.5947	.6354	.6470				
20	.4236	.5414	.5806	.6271	.6446				
23	.4030	.5381	.5831	.6325	.6499				
00	.7042	.7027	.7114	.7173	.7114	-085	000	5	2
04	.6940	.6969	.7085	.7173	.7114				
08	.6611	.6705	.6930	.7075	.7075				
12	.6393	.6552	.6799	.6465	.6523				
16	.5773	.6063	.5744	.6180	.6310				
20	.4694	.5101	.5522	.6030	.6233				
23	.4288	.5014	.5507	.6044	.6262				
00	.7056	.7027	.7114	.7187	.7114	-090	000	5	2
04	.6935	.6979	.7080	.7167	.7124				
08	.6649	.6766	.6940	.7056	.7027				
12	.6461	.6606	.6751	.6954	.6954				
16	.5769	.6059	.6262	.6015	.6175				
20	.5079	.4803	.5254	.5792	.6024				
23	.4723	.4665	.5188	.5769	.6001				
00	.7046	.7046	.7133	.7206	.7133	-095	000	5	2
04	.6911	.6969	.7085	.7158	.7100				
08	.6664	.6766	.6911	.7056	.7013				
12	.6261	.6567	.6683	.6872	.6858				
16	.5243	.5999	.6189	.6509	.6029				
20	.5112	.5461	.5228	.5548	.5796				
23	.4741	.4726	.4886	.5498	.5746				
00	.7032	.7076	.7120	.7150	.7091	-100	000	5	3
00	.7022	.7081	.7125	.7155	.7081				
04	.6856	.7003	.7076	.7120	.7061				
08	.6665	.6841	.6959	.7018	.6989				
12	.5210	.6503	.6635	.6841	.6841				
16	.4093	.5960	.6135	.6456	.6529				
16	.4070	.5939	.6144	.6450	.6524				
20	.4283	.5469	.5601	.5762	.5630				
23	.3804	.5190	.5249	.5249	.5526				
00	.7049	.7064	.7137	.7195	.7122	-105	000	5	3
04	.6786	.6991	.7049	.7137	.7093				
08	.6728	.6816	.6903	.7035	.7006				
12	.3994	.6435	.6616	.6806	.6806				
16	.3368	.5837	.6027	.6436	.6597				
20	.2715	.5377	.5494	.5802	.5875				
23	.2681	.5059	.5236	.5559	.5192				
00	.7060	.7045	.7118	.7191	.7133	-110	000	5	3
04	.6645	.6968	.7056	.7174	.7115				
08	.6562	.6811	.6928	.7060	.7016				
12	.3498	.6489	.6591	.6811	.6811				
16	.3361	.5780	.6159	.6407	.6480				
20	.3225	.5286	.5359	.5666	.5783				
23	.3733	.4993	.5111	.5433	.5521				
00	.7065	.7036	.7123	.7197	.7138	-115	000	5	3

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 2P9-19 $M_o = 2.00$

α_1 \ $P_t'/P_{t,o}$	0.069	0.269	0.469	0.669	0.869	β_R	β Knobs	Run
04	.6459	.6973	.7061	.7179	.7120			
08	.5990	.6820	.6936	.7082	.7053			
12	.4542	.6494	.6596	.6831	.6846			
16	.3207	.5980	.6317	.6464	.6435			
20	.3334	.5239	.5341	.5605	.5693			
23	.3663	.4920	.5008	.5300	.5417			
00	.7065	.7036	.7109	.7211	.7153	-120	000 5	3
04	.6197	.6972	.7060	.7191	.7147			
08	.5056	.6826	.6957	.7118	.7074			
12	.4738	.6431	.6563	.6825	.6854			
16	.3361	.5882	.6340	.6397	.6426			
20	.3269	.5347	.5794	.6011	.5967			
23	.3446	.4990	.5150	.5310	.5281			
00	.7077	.7033	.7077	.7106	.7164	-125	000 5	3
04	.5864	.6971	.7058	.7204	.7174			
08	.3950	.6830	.6960	.7106	.7077			
12	.5099	.6204	.6495	.6800	.6859			
16	.2659	.5077	.6140	.6271	.6359			
20	.3242	.4320	.5878	.5922	.5922			
23	.3264	.3935	.5351	.5439	.5380			
00	.7058	.7043	.7029	.7087	.7184	-130	000 5	3
04	.5589	.6984	.7057	.7115	.7188			
08	.3242	.6839	.6971	.7145	.7116			
12	.4305	.5135	.6417	.6796	.6869			
16	.2516	.4921	.5139	.6072	.6305			
20	.2720	.3959	.5431	.5708	.5751			
23	.2428	.3988	.4964	.5227	.5197			
00	.7063	.7034	.7034	.7092	.7151	-135	000 5	3
04	.5314	.7005	.7034	.7092	.7194			
08	.2786	.6850	.6981	.7113	.7128			
12	.3508	.3991	.6348	.6787	.6889			
16	.3222	.5443	.4479	.5720	.6202			
20	.2581	.4409	.4716	.5227	.5549			
23	.2974	.4990	.3836	.4683	.4958			
00	.7084	.7084	.7084	.7055	.7025	-150	000 5	3
04	.5034	.7070	.7070	.7041	.7070			
08	.3347	.6860	.6977	.7065	.7094			
12	.3090	.3295	.6529	.6846	.7022			
16	.5576	.1928	.1737	.5444	.6425			
20	.5737	.4873	.2060	.3144	.3818			
23	.5151	.3525	.2118	.2734	.3085			

APPENDIX B (CONTINUED)

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

a_i \ y	1.069	1.269	1.469	1.669	β_R	ϕ	Rake	Run
00	.7009	.7009	.6980	.6980	030	000	5	1
04	.7005	.6990	.6976	.6976				
08	.7015	.7030	.7044	.7050				
12	.7201	.7245	.7259	.7274				
16	.7497	.7511	.7526	.7555				
20	.7826	.7826	.7841	.7855				
23	.8004	.8054	.8040	.8054				
00	.7067	.7052	.7037	.7037	015	000	5	1
04	.7019	.7019	.7019	.7034				
08	.7072	.7086	.7101	.7130				
12	.7280	.7309	.7324	.7339				
16	.7566	.7580	.7595	.7624				
20	.7906	.7906	.7906	.7920				
23	.8135	.8121	.8106	.8106				
00	.7043	.7043	.7014	.6999	000	000	5	1
04	.7014	.7014	.7029	.7029				
08	.7090	.7119	.7119	.7148				
12	.7306	.7320	.7349	.7378				
16	.7589	.7604	.7618	.7647				
20	.7909	.7909	.7909	.7923				
23	.8141	.8127	.8127	.8112				
00	.7048	.7019	.6990	.6990	-015	000	5	1
04	.7028	.6999	.6999	.6999				
08	.7067	.7096	.7110	.7110				
12	.7250	.7294	.7308	.7323				
16	.7542	.7571	.7600	.7615				
20	.7836	.7851	.7865	.7880				
23	.8066	.8066	.8080	.8066				
00	.6946	.6931	.7004	.7004	-030	000	5	1
04	.6941	.6898	.6956	.7000				
08	.6965	.6950	.6979	.7067				
12	.7135	.7150	.7193	.7251				
16	.7377	.7406	.7508	.7522				
20	.7659	.7746	.7775	.7804				
23	.7920	.7978	.7993	.8051				
00	.7004	.7077	.7048	.7004	-040	000	5	1
04	.6980	.7053	.7024	.6995				
08	.6980	.7096	.7096	.7082				
12	.7111	.7257	.7242	.7242				
16	.7339	.7484	.7484	.7469				
20	.7684	.7728	.7728	.7699				
23	.7900	.7929	.7914	.7870				
00	.7092	.7049	.7005	.6976	-045	000	5	1
04	.7063	.7019	.6976	.6961				
08	.7063	.7034	.7019	.7019				
12	.7151	.7165	.7165	.7165				
16	.7355	.7384	.7384	.7384				
20	.7597	.7626	.7626	.7611				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 M_o = 2.00

$P_t/P_{t,o}$

ϕ \ y	1.069	1.269	1.469	1.669	M_a	β		
23	.7772	.7815	.7801	.7772				
00	.7066	.7022	.6979	.6964	-030	000	5	2
04	.7060	.7032	.6958	.6944				
08	.7137	.7093	.6993	.6993				
12	.7093	.7105	.7115	.7120				
16	.7256	.7285	.7288	.7314				
20	.7508	.7537	.7547	.7547				
23	.7664	.7717	.7721	.7707				
00	.7040	.6982	.6982	.6968	-055	000	5	2
04	.7011	.6969	.6953	.6968				
08	.6974	.6967	.6951	.6989				
12	.7018	.7132	.7076	.7120				
16	.7163	.7207	.7236	.7280				
20	.7301	.7447	.7489	.7493				
23	.7531	.7603	.7647	.7618				
00	.7029	.6939	.6950	.6999	-060	000	5	2
04	.6980	.6945	.6945	.6960				
08	.6941	.6941	.6955	.6984				
12	.6945	.6960	.7032	.7061				
16	.7062	.7121	.7179	.7208				
20	.7272	.7359	.7409	.7418				
23	.7402	.7534	.7563	.7549				
00	.7009	.7009	.6989	.6974	-065	000	5	2
04	.7014	.6997	.6970	.6970				
08	.6897	.6927	.6956	.6985				
12	.6844	.6902	.6961	.7004				
16	.6956	.7050	.7116	.7146				
20	.7122	.7259	.7312	.7312				
23	.7252	.7308	.7456	.7427				
00	.7037	.7023	.6994	.6979	-070	000	5	2
04	.7014	.7014	.7000	.7000				
08	.6844	.6909	.6931	.6946				
12	.6809	.6978	.6937	.6981				
16	.6854	.6971	.7043	.7073				
20	.6999	.7151	.7209	.7209				
23	.7107	.7268	.7326	.7326				
00	.7051	.7051	.7051	.7051	-075	000	5	2
04	.7002	.6988	.6988	.6988				
08	.6858	.6887	.6930	.6945				
12	.6751	.6838	.6896	.6925				
16	.6761	.6892	.6965	.6994				
	.6839							
20	.6859	.7013	.7072	.7101				
23	.6441	.7130	.7209	.7188				
00	.7043	.7043	.7043	.7028	-080	000	5	2
04	.7048	.7019	.7019	.7019				
08	.6901	.6901	.6915	.6945				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t/P_{t,o}$

α_1 \ y	1.069	1.269	1.469	1.669	ϕ_2	ϕ	Rake	Run
12	.6732	.6819	.6878	.6922				
16	.6673	.6804	.6877	.6906				
20	.6707	.6867	.6940	.6969				
23	.6761	.6964	.7051	.7051				
00	.7056	.7056	.7056	.7042	-085	000	5	2
04	.7085	.7056	.7056	.7042				
08	.6959	.6944	.6930	.6959				
12	.6669	.6755	.6814	.6857				
16	.6557	.6673	.6761	.6819				
20	.6523	.6727	.6814	.6843				
23	.6552	.6785	.6872	.6901				
00	.7071	.7071	.7071	.7056	-090	000	5	2
04	.7095	.7080	.7051	.7051				
08	.6984	.6969	.6940	.6940				
12	.6635	.6707	.6780	.6809				
16	.6436	.6582	.6683	.6727				
20	.6358	.6562	.6678	.6707				
23	.6335	.6582	.6712	.6756				
00	.7075	.7061	.7061	.7046	-095	000	5	2
04	.7085	.7085	.7056	.7056				
08	.6998	.6984	.6969	.6940				
12	.6581	.6654	.6712	.6770				
16	.6334	.6509	.6596	.6654				
20	.6159	.6392	.6523	.6567				
23	.6125	.6402	.6547	.6576				
00	.7061	.7061	.7061	.7061	-100	000	5	3
00	.7067	.7067	.7067	.7052				
04	.7076	.7076	.7061	.7047				
08	.7018	.7018	.7003	.6989				
12	.6870	.6679	.6709	.6753				
16	.6251	.6426	.6529	.6587				
16	.6261	.6436	.6524	.6582				
20	.6011	.6274	.6406	.6465				
23	.5935	.6227	.6373	.6402				
00	.7079	.7079	.7079	.7064	-105	000	5	3
04	.7079	.7079	.7079	.7049				
08	.7020	.7020	.7020	.6991				
12	.6879	.6893	.6893	.6747				
16	.6144	.6319	.6436	.6494				
20	.5772	.6050	.6197	.6255				
23	.5661	.5955	.6102	.6161				
00	.7060	.7060	.7045	.7030	-110	000	5	3
04	.7086	.7086	.7086	.7056				
08	.7030	.7030	.7030	.7016				
12	.6885	.6914	.6929	.6885				
16	.6742	.6844	.6334	.6393				
20	.5914	.5885	.6031	.6104				
23	.5375	.5712	.5873	.5961				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 M_o = 2.00

$P_t'/P_{t,o}$

ϕ \ y	1.069	1.269	1.469	1.669	β_a	ϕ	$\frac{R}{S}$	$\frac{R}{S}$
00	.7065	.7065	.7036	.7036	-115	000	5	3
04	.7091	.7091	.7091	.7076				
08	.7053	.7053	.7038	.6995				
12	.6904	.6919	.6934	.6904				
16	.6699	.6772	.6816	.6347				
20	.6015	.6330	.5927	.6015				
23	.5622	.5520	.5695	.5797				
00	.7065	.7065	.7065	.7036	-120	000	5	3
04	.7089	.7089	.7074	.7045				
08	.7060	.7060	.7036	.7001				
12	.6913	.6927	.6927	.6898				
16	.6598	.6741	.6770	.6755				
20	.5953	.6155	.6256	.5939				
23	.5514	.5747	.5514	.5631				
00	.7077	.7077	.7048	.7019	-125	000	5	3
04	.7087	.7087	.7058	.7029				
08	.7033	.7048	.7019	.7019				
12	.6902	.6931	.6931	.6902				
16	.6577	.6738	.6781	.6767				
20	.6213	.6388	.6505	.6563				
23	.5439	.5614	.5760	.5607				
00	.7087	.7058	.7029	.7000	-130	000	5	3
04	.7101	.7072	.7043	.7014				
08	.7058	.7043	.7029	.7014				
12	.6912	.6941	.6941	.6941				
16	.6553	.6713	.6801	.6801				
20	.6043	.6247	.6422	.6568				
23	.5314	.5547	.5751	.5883				
00	.7121	.7063	.7005	.6990	-135	000	5	3
04	.7121	.7063	.7034	.7019				
08	.7074	.7055	.7040	.7025				
12	.6948	.6948	.6948	.6977				
16	.6553	.6712	.6816	.6933				
20	.5914	.6236	.6529	.6616				
23	.5092	.5413	.5998	.6188				
00	.7055	.7040	.7113	.7084	-150	000	5	3
04	.7099	.7173	.7143	.7099				
08	.7167	.7138	.7109	.7109				
12	.7080	.7051	.7110	.7080				
16	.6880	.6924	.6938	.6353				
20	.5853	.6308	.6513	.6601				
23	.4404	.5341	.5795	.6074				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_i \ y	2.069	2.269	2.469	2.669	2.869	β_R	ϕ	Rake	Run
00	.6951	.6907	.6879	.6907	.6907	030	000	5	1
04	.6976	.6976	.6932	.6932	.6903				
08	.7079	.7068	.7068	.7098	.7098				
12	.7303	.7303	.7332	.7347	.7332				
16	.7590	.7570	.7590	.7613	.7628				
20	.7885	.7855	.7885	.7865	.7929				
23	.8098	.8054	.8084	.8069	.7104				
00	.7023	.6994	.6979	.6950	.6936	015	000	5	1
04	.7034	.7019	.7019	.7019	.7005				
08	.7159	.7159	.7174	.7202	.7188				
12	.7368	.7382	.7397	.7426	.7455				
16	.7653	.7653	.7653	.7667	.7755				
20	.7920	.7906	.7920	.7949	.7135				
23	.8106	.8092	.8077	.7061	.7076				
00	.6984	.6970	.6941	.6926	.6897	000	000	5	1
04	.7029	.7014	.6985	.7000	.7000				
08	.7177	.7177	.7177	.7207	.7207				
12	.7408	.7408	.7408	.7437	.7495				
16	.7647	.7662	.7647	.7676	.7764				
20	.7938	.7909	.7880	.7967	.7091				
23	.8112	.8083	.7746	.7087	.7023				
00	.6990	.6960	.6917	.6902	.6888	-015	000	5	1
04	.7014	.7014	.6976	.6954	.6970				
08	.7125	.7125	.7125	.7168	.7154				
12	.7352	.7352	.7352	.7395	.7410				
16	.7629	.7629	.7615	.7629	.7717				
20	.7894	.7865	.7836	.7865	.7952				
23	.8066	.8051	.8022	.6900	.6944				
00	.7091	.7048	.7004	.6960	.6931	-030	000	5	1
04	.7102	.7087	.7043	.7043	.7014				
08	.7110	.7183	.7183	.7197	.7183				
12	.7324	.7382	.7368	.7397	.7368				
16	.7624	.7624	.7595	.7624	.7595				
20	.7891	.7862	.7848	.7848	.7918				
23	.8066	.8037	.8008	.8008	.6917				
00	.6975	.6960	.6960	.6931	.6931	-040	000	5	1
04	.6989	.6989	.6966	.6995	.6995				
08	.7067	.7067	.7096	.7126	.7126				
12	.7242	.7242	.7271	.7315	.7315				
16	.7469	.7469	.7484	.7528	.7513				
20	.7684	.7713	.7713	.7742	.7720				
23	.7841	.7870	.7856	.7900	.7870				
00	.6976	.6961	.6961	.6947	.6917	-045	000	5	1
04	.6976	.6976	.6961	.6990	.6990				
08	.7034	.7063	.7078	.7107	.7121				
12	.7194	.7223	.7238	.7282	.7282				
16	.7413	.7442	.7457	.7500	.7471				
20	.7626	.7655	.7655	.7699	.7684				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

ψ / u_i	2.069	2.269	2.469	2.669	2.869	ϕ_R	ϕ	Rake	Run
23	.7772	.7815	.7786	.7830	.7815				
00	.6964	.6949	.6949	.6935	.6906	-050	000	5	2
04	.6958	.6958	.6958	.6973	.6958				
08	.7022	.7037	.7051	.7080	.7095				
12	.7163	.7192	.7207	.7251	.7251				
16	.7343	.7401	.7401	.7445	.7445				
20	.7561	.7619	.7605	.7648	.7648				
23	.7693	.7765	.7750	.7779	.7765				
00	.6968	.6953	.6939	.6924	.6924	-055	000	5	2
04	.6958	.6968	.6968	.6982	.6968				
08	.7018	.7032	.7047	.7076	.7076				
12	.7134	.7163	.7192	.7221	.7236				
16	.7294	.7352	.7352	.7411	.7425				
20	.7483	.7556	.7556	.7600	.7585				
23	.7603	.7690	.7661	.7690	.7690				
00	.6984	.6970	.6955	.6941	.6941	-060	000	5	2
04	.6960	.6960	.6960	.6960	.6960				
08	.6999	.7013	.7013	.7057	.7072				
12	.7090	.7149	.7149	.7207	.7207				
16	.7237	.7296	.7296	.7354	.7368				
20	.7418	.7476	.7476	.7520	.7534				
23	.7520	.7607	.7593	.7651	.7636				
00	.6960	.6945	.6930	.6930	.6916	-065	000	5	2
04	.6970	.6970	.6956	.6970	.6956				
08	.7000	.7014	.7014	.7043	.7043				
12	.7033	.7062	.7091	.7135	.7164				
16	.7160	.7219	.7233	.7292	.7306				
20	.7297	.7399	.7399	.7458	.7472				
23	.7398	.7514	.7500	.7543	.7529				
00	.6965	.6950	.6936	.6921	.6906	-070	000	5	2
04	.7000	.6970	.6970	.6970	.6956				
08	.6960	.6975	.6989	.7019	.7019				
12	.6995	.7039	.7068	.7112	.7127				
16	.7087	.7160	.7189	.7248	.7262				
20	.7195	.7297	.7297	.7370	.7355				
23	.7282	.7414	.7370	.7443	.7443				
00	.7022	.7008	.6964	.6964	.6949	-075	000	5	2
04	.6973	.6959	.6930	.6973	.6959				
08	.6974	.6974	.6960	.7018	.7032				
12	.6954	.7012	.6997	.7070	.7099				
16	.7008	.7096	.7096	.7183	.7198				
20	.7086	.7203	.7174	.7261	.7276				
23	.7159	.7305	.7247	.7334	.7334				
00	.7013	.6984	.6955	.6984	.6970	-080	000	5	2
04	.7004	.6989	.6960	.6989	.6975				
08	.6960	.6974	.6945	.7003	.7003				
12	.6951	.6994	.6994	.7053	.7067				

INDICATED TOTAL PRESSURE RATIOS FOR GAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_i \ y	2.069	2.269	2.469	2.669	2.869	ϕ_R	ϕ	Rake	Run
16	.6935	.7022	.7008	.7109	.7095				
20	.6969	.7065	.7056	.7143	.7173				
23	.7022	.7167	.7138	.7196	.7211				
00	.7027	.6998	.6969	.6984	.6969	-085	000	5	2
04	.7027	.7027	.6998	.6998	.6984				
08	.6973	.6988	.6959	.6973	.6988				
12	.6886	.6930	.6930	.6988	.7002				
16	.6848	.6935	.6935	.7008	.7022				
20	.6828	.6959	.6944	.7046	.7061				
23	.6857	.7017	.6973	.7046	.7046				
00	.7056	.7042	.7027	.7027	.6984	-090	000	5	2
04	.7051	.7037	.6993	.6993	.6993				
08	.6954	.6954	.6940	.6969	.6969				
12	.6838	.6896	.6896	.6954	.6954				
16	.6756	.6857	.6857	.6930	.6959				
20	.6693	.6838	.6795	.6911	.6940				
23	.6698	.6872	.6799	.6915	.6930				
00	.7075	.7031	.6988	.6988	.6973	-095	000	5	2
04	.7042	.6998	.6969	.6984	.6969				
08	.6940	.6940	.6896	.6940	.6940				
12	.6785	.6843	.6829	.6916	.6916				
16	.6654	.6770	.6756	.6843	.6872				
20	.6567	.6712	.6683	.6800	.6829				
23	.6518	.6722	.6664	.6766	.6766				
00	.7047	.7032	.7003	.7003	.6973	-100	000	5	3
00	.7037	.7008	.6978	.6978	.6964				
04	.7047	.7032	.7003	.7003	.6973				
08	.6959	.6959	.6930	.6959	.6944				
12	.6768	.6826	.6826	.6885	.6885				
16	.6602	.6689	.6689	.6762	.6806				
16	.6597	.6699	.6699	.6772	.6816				
20	.6450	.6626	.6596	.6714	.6728				
23	.6358	.6577	.6533	.6636	.6636				
00	.7049	.7020	.6976	.6991	.6962	-105	000	5	3
04	.7049	.7020	.6962	.6991	.6962				
08	.6962	.6947	.6903	.6918	.6874				
12	.6733	.6777	.6733	.6791	.6806				
16	.6494	.6597	.6582	.6684	.6713				
20	.6255	.6445	.6416	.6533	.6562				
23	.6131	.6366	.6337	.6440	.6454				
00	.7030	.7001	.6957	.6972	.6972	-110	000	5	3
04	.7056	.7027	.6983	.6968	.6939				
08	.6972	.6943	.6870	.6884	.6855				
12	.6738	.6738	.6709	.6767	.6767				
16	.6422	.6538	.6538	.6626	.6655				
20	.6119	.6324	.6324	.6441	.6470				
23	.5946	.6196	.6181	.6284	.6298				
00	.7036	.7006	.6962	.6962	.6918	-115	000	5	3

APPENDIX B (CONTINUED)

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_1 \ y	2.069	2.269	2.469	2.669	2.869	β_R	ϕ	Rake	Run
04	.7047	.7003	.6959	.6944	.6914				
08	.6980	.6936	.6878	.6893	.6864				
12	.6846	.6787	.6728	.6758	.6758				
16	.6376	.6494	.6508	.6582	.6611				
20	.6045	.6250	.6250	.6367	.6396				
23	.5797	.6061	.6046	.6177	.6236				
00	.7006	.6977	.6948	.6948	.6918	-120	000	5	3
04	.7016	.6987	.6943	.6943	.6913				
08	.6987	.6957	.6913	.6913	.6870				
12	.6869	.6854	.6767	.6767	.6767				
16	.6641	.6512	.6469	.6555	.6569				
20	.5982	.6184	.6198	.6328	.6400				
23	.5631	.5922	.5951	.6097	.6126				
00	.6990	.6960	.6917	.6931	.6902	-125	000	5	3
04	.7029	.6971	.6941	.6941	.6912				
08	.6975	.6960	.6917	.6931	.6902				
12	.6888	.6902	.6844	.6844	.6815				
16	.6738	.6796	.6592	.6621	.6650				
20	.5922	.6170	.6170	.6301	.6330				
23	.5526	.5818	.5847	.5993	.6052				
00	.7000	.6971	.6912	.6941	.6912	-130	000	5	3
04	.7014	.6955	.6926	.6955	.6926				
08	.7000	.6971	.6941	.6956	.6956				
12	.6912	.6941	.6898	.6941	.6883				
16	.6796	.6888	.6815	.6830	.6742				
20	.6670	.6699	.6597	.6349	.6393				
23	.5868	.5722	.5780	.5926	.5985				
00	.6976	.6947	.6917	.6932	.6917	-135	000	5	3
04	.7005	.6976	.6947	.6961	.6976				
08	.7011	.6996	.6996	.7040	.6996				
12	.6992	.7006	.6948	.6977	.6948				
16	.6903	.6933	.6859	.6903	.6874				
20	.6631	.6762	.6762	.6762	.6718				
23	.6202	.6465	.6480	.6524	.6085				
00	.7055	.6996	.6938	.6996	.6967	-150	000	5	3
04	.7070	.7070	.7011	.7041	.7011				
08	.7123	.7065	.7036	.7065	.7036				
12	.7066	.7066	.7007	.7051	.7051				
16	.6982	.6997	.6982	.7026	.6997				
20	.6645	.6777	.6748	.6836	.6850				
23	.6220	.6425	.6455	.6572	.6601				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α \ y	3.069	3.269	3.469	β_R	β	Ratio	Run
00	.6849	.6776	.6835	030	000	5	1
04	.6932	.6980	.7092				
08	.7103	.7249	.7380				
12	.7423	.7538	.7610				
16	.7730	.7818	.7891				
20	.7894	.7879	.7894				
23	.7845	.7830	.7845				
00	.6878	.6820	.6892	015	000	5	1
04	.6990	.7078	.7180				
08	.7261	.7362	.7449				
12	.7557	.7659	.7746				
16	.7856	.7958	.7130				
20	.7091	.7106	.7106				
23	.7032	.7047	.7061				
00	.6854	.6810	.6897	000	000	5	1
04	.6985	.7073	.7174				
08	.7294	.7395	.7497				
12	.7582	.7684	.7786				
16	.7880	.7430	.7125				
20	.7067	.7081	.7067				
23	.6994	.7023	.7037				
00	.6830	.6757	.6815	-015	000	5	1
04	.6955	.7028	.7115				
08	.7226	.7328	.7415				
12	.7526	.7627	.7714				
16	.7804	.7920	.7106				
20	.6994	.7023	.7037				
23	.6931	.6975	.6990				
00	.6859	.6800	.6873	-030	000	5	1
04	.6971	.7029	.7131				
08	.7212	.7299	.7386				
12	.7455	.7557	.7659				
16	.7682	.7798	.7885				
20	.7906	.7019	.7048				
23	.6888	.6931	.6960				
00	.6888	.6830	.6902	-040	000	5	1
04	.6966	.7009	.7111				
08	.7155	.7257	.7344				
12	.7373	.7475	.7577				
16	.7571	.7702	.7789				
20	.7786	.7903	.7014				
23	.7068	.6908	.6922				
00	.6888	.6830	.6903	-045	000	5	1
04	.6961	.6990	.7092				
08	.7121	.7223	.7311				
12	.7311	.7413	.7530				
16	.7515	.7632	.7734				
20	.7699	.7815	.7903				

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

α_1 \ y	3.069	3.269	3.469	ϕ_R	ϕ	Rake	Run
23	.7815	.6898	.6912				
00	.6862	.6804	.6877	-050	000	5	2
04	.6929	.6956	.7069				
08	.7095	.7182	.7284				
12	.7265	.7367	.7483				
16	.7460	.7547	.7634				
20	.7677	.7749	.7836				
23	.7793	.7822	.6870				
00	.6881	.6823	.6895	-055	000	5	2
04	.6968	.6982	.7069				
08	.7090	.7149	.7265				
12	.7251	.7323	.7425				
16	.7440	.7498	.7600				
20	.7629	.7658	.7745				
23	.7748	.7777	.7821				
00	.6911	.6853	.6926	-060	000	5	2
04	.6930	.6960	.7047				
08	.7072	.7115	.7232				
12	.7221	.7265	.7367				
16	.7398	.7441	.7543				
20	.7593	.7622	.7666				
23	.7709	.7739	.7724				
00	.6887	.6829	.6901	-065	000	5	2
04	.6941	.6941	.7043				
08	.7058	.7073	.7175				
12	.7193	.7208	.7296				
16	.7365	.7379	.7423				
20	.7531	.7560	.7560				
23	.7616	.7660	.7660				
00	.6877	.6834	.6921	-070	000	5	2
04	.6941	.6941	.7029				
08	.7048	.7048	.7150				
12	.7171	.7185	.7244				
16	.7321	.7335	.7335				
20	.7443	.7472	.7487				
23	.7531	.7560	.7575				
00	.6906	.6848	.6935	-075	000	5	2
04	.6959	.6930	.7017				
08	.7032	.7032	.7090				
12	.7142	.7157	.7157				
16	.7256	.7285	.7299				
20	.7363	.7392	.7407				
23	.7436	.7480	.7480				
00	.6926	.6882	.6955	-080	000	5	2
04	.6960	.6902	.6989				
08	.7003	.7003	.7032				
12	.7111	.7140	.7140				

INDICATED TOTAL PRESSURE RATIOS FOR CAL TEST 289-19 $M_\infty = 2.00$

$P_2'/P_{t,\infty}$

α_1 \ γ	3.059	3.259	3.469	β_R	ϕ		
16	.7196	.7225	.7225				
20	.7261	.7313	.7318				
23	.7327	.7356	.7356				
00	.6935	.6867	.6947	-085	000	5	2
04	.6954	.6896	.6960				
08	.7002	.7002	.7002				
12	.7046	.7075	.7075				
16	.7109	.7138	.7167				
20	.7162	.7191	.7206				
23	.7191	.7235	.7235				
00	.6940	.6882	.6960	-090	000	5	2
04	.6954	.6916	.6949				
08	.6984	.6960	.6956				
12	.7012	.7041	.7041				
16	.7046	.7075	.7090				
20	.7056	.7085	.7114				
23	.7075	.7104	.7104				
00	.6930	.6872	.6930	-095	000	5	2
04	.6940	.6882	.6911				
08	.6969	.6969	.6940				
12	.6974	.6989	.6989				
16	.6960	.7018	.7018				
20	.6945	.6974	.6974				
23	.6926	.6970	.6970				
00	.6944	.6870	.6914	-100	000	5	3
00	.6934	.6961	.6927				
04	.6944	.6885	.6885				
08	.6944	.6931	.6915				
12	.6944	.6973	.6973				
16	.6893	.6947	.6952				
16	.6909	.6933	.6962				
20	.6860	.6874	.6904				
23	.6811	.6841	.6840				
00	.6933	.6874	.6918	-105	000	5	3
04	.6933	.6845	.6845				
08	.6889	.6874	.6845				
12	.6849	.6864	.6879				
16	.6801	.6830	.6859				
20	.6709	.6738	.6767				
23	.6630	.6674	.6704				
00	.6913	.6926	.6940	-110	000	5	3
04	.6895	.6851	.6821				
08	.6870	.6855	.6840				
12	.6811	.6841	.6841				
16	.6742	.6772	.6786				
20	.6601	.6645	.6689				
23	.6518	.6591	.6606				
00	.6875	.6916	.6889	-115	000	5	3

INDICATED TOTAL PRESSURE RATIOS FOR OAL TEST 289-19 $M_o = 2.00$

$P_t'/P_{t,o}$

a_1 \ y	3.069	3.269	3.469	ϕ_R	ϕ	Rake	Run
04	.6885	.6841	.6797				
08	.6864	.6849	.6820				
12	.6816	.6816	.6831				
16	.6699	.6728	.6787				
20	.6587	.6631	.6660				
23	.6411	.6470	.6499				
00	.6860	.6801	.6875	-120	000	5	3
04	.6899	.6826	.6767				
08	.6870	.684[illegible]	.6826				
12	.6781	.6796	.6840				
16	.6698	.6741	.6770				
20	.6545	.6588	.6602				
23	.6330	.6373	.6368				
00	.6873	.6815	.6873	-125	000	5	3
04	.6883	.6839	.6752				
08	.6859	.6844	.6859				
12	.6830	.6830	.6830				
16	.6694	.6738	.6738				
20	.6490	.6505	.6519				
23	.6227	.6285	.6329				
00	.6883	.6810	.6869	-130	000	5	3
04	.6897	.6868	.6781				
08	.6927	.6898	.6854				
12	.6898	.6854	.6839				
16	.6713	.6742	.6699				
20	.6451	.6466	.6495				
23	.6159	.6232	.6261				
00	.6888	.6830	.6888	-135	000	5	3
04	.6947	.6888	.6801				
08	.6967	.6923	.6879				
12	.6933	.6889	.6831				
16	.6874	.6757	.6699				
20	.6484	.6499	.6543				
23	.6231	.6231	.6231				
00	.6908	.6850	.6864	-150	000	5	3
04	.6953	.6894	.6806				
08	.7036	.6977	.6918				
12	.7036	.7007	.6948				
16	.7011	.6967	.6953				
20	.6909	.6924	.6894				
23	.6748	.6762	.6762				

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Langley
Technical Monitors: Wallace C. Sawyer and Charlie M. Jackson, Jr.

Topical Report

16. Abstract

The Bumblebee Program, initiated in 1945 by the U.S. Navy Bureau of Ordinance, was designed to provide a supersonic-guided missile. The Aerodynamic Program included a fundamental research effort in supersonic aerodynamics as well as a design task in developing both vehicles and prototypes of tactical missiles.

A series of four reports were prepared in order to facilitate dissemination of a large amount of fundamental aerodynamic missile data, which has been stored for a number of years at the Applied Physics Laboratory.

This report provides data that supplements the M = 2.0 flow field data given in Part II. The enclosed data package (Appendix A) describes the Mach number effect by means of pressure fields only, at M = 1.5 and 2.0, and at angles of attack up to 23^{0} at a mid-body station where a wing might be located.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
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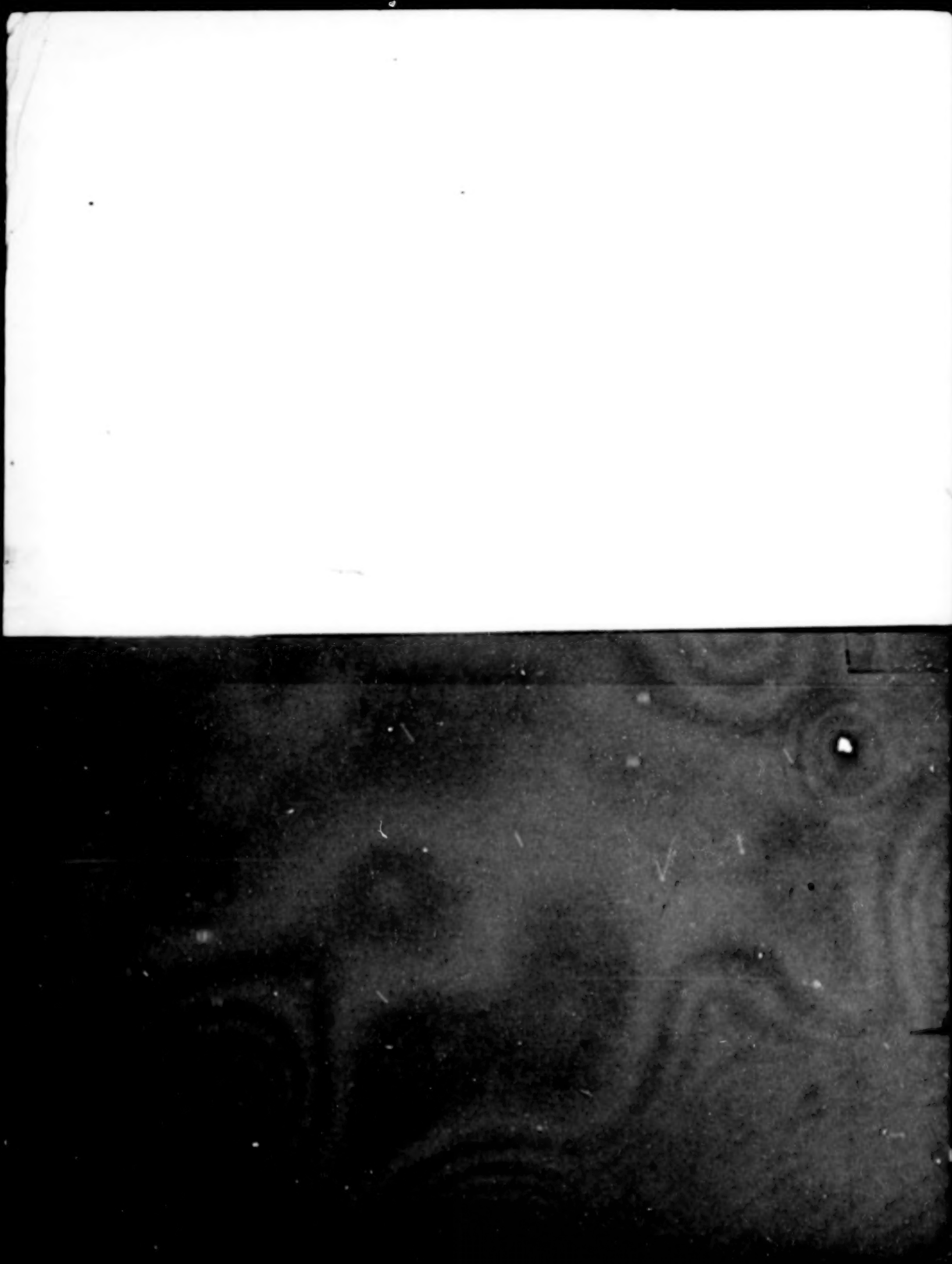

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June 17, 1981